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# Analysis of Assistments Online Tutoring System and Accuplacer

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# **IQP Research Paper**

## **2011 - 2012**



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# **IQP Research Paper 2011 - 2012**

## **Abstract**

There have been many approaches to improve student learning. In this study, we look at the ASSISTments online tutoring system to prove that instant feedback increases content learning. We find that by having a system that provides correctional feedback as well as instant tutoring, students learn the material presented to them, and do so at their own pace. After experimenting in one university, two high schools and one middle school, three of our experiments support the use of an online tutoring system. We compare this system to a stripped down version of ASSISTments to simulate a typical learning situation presented to students which receive packets of work to complete and potentially prepare them for an upcoming exam. We conclude by revealing that the students who were presented with the full version of ASSISTments, namely the Gold group, outperformed the students in the stripped down ASSISTments, namely the Blue group. We suspect the instant tutoring and corrective feedback are major areas that native teaching methods lack in efficiency and effectiveness.

# Introduction

ASSISTments is an online system developed to support schools who want to use current data to inform instruction. It is a blend of assessment and assistance. The system tutors students while assessing their understanding of grade-specific knowledge components. Teachers can get real-time reports on student performance. ASSISTments has modules for Mastery Learning (where ASSISTments provides the tedious bookkeeping functions), nightly homework (ASSISTments checks for accuracy and reports correct and incorrect feedback to teachers and students), parental notification of student performance, and more. The system collects and documents evidence of student learning, provides students with descriptive feedback to help those close gaps in understanding, and provides parents with specific information about what students know and understand.<sup>1</sup>

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<sup>1</sup> <http://teacherwiki.assistment.org/wiki/index.php/Mainei3>

# Background

## Overview

A learning management system is a software application that establishes an environment geared towards maintaining, assigning, documenting, and reviewing content. A well-established learning management system should allow the following:

- Consolidate resources
- Distribute and maintain content
- Personalize content
- Accumulating and assessing progression

## Systems

There are many systems trying to assist the teachers and student of schools across the nation and across the world. Here are some systems that are currently being used in schools by hundreds of teachers.

### Moodle

#### What is Moodle?

The focus of the Moodle project is always on giving educators the best tools to manage and promote learning, but there are many ways to use Moodle:

- Moodle has features that allow it to scale to very large deployments and hundreds of thousands of students, yet it can also be used for a primary school or an education hobbyist.
- Many institutions use it as their platform to conduct fully online courses, while some use it simply to augment face-to-face courses (known as blended learning).
- Many of our users love to use the activity modules (such as forums, databases and wikis) to build richly collaborative communities of learning around their subject matter (in the social constructionist tradition), while others prefer to use Moodle as a way to deliver content to students (such as standard SCORM packages) and assess learning using assignments or quizzes.<sup>2</sup>

### ASSISTments

#### What is ASSISTments?

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<sup>2</sup> <http://moodle.org/about/>

ASSISTments is a non-profit research project used by hundreds of teachers. ASSISTments is a free web-based platform, hosted by WPI, which allows teachers to write individual ASSISTments (composed of questions and associated hints, solutions, web-based videos, etc.) The word “ASSISTments” blends tutoring “assistance” with “assessment” reporting to teachers. It supports all subjects (i.e., Math, English, etc.) and due to federal grants, has a huge repository of math content. ASSISTments is not just a math tutoring system. It's an ecosystem of researchers, schools, parents, funders, and state partners, working together to help students. Each of the partners gets something out of it and each contributes something.<sup>3</sup>

## **Pearson**

### **What is Pearson?**

As the leading education services company, Pearson is serious about evolving how the world learns. We apply our deep education experience and research, invest in innovative technologies, and promote collaboration throughout the education ecosystem. Real change is our commitment and its results are delivered through connecting capabilities to create actionable, scalable solutions that improve access, affordability, and achievement.<sup>4</sup>

## **Khan Academy**

### **What is Khan Academy?**

The Khan Academy is an organization on a mission. We're a not-for-profit with the goal of changing education for the better by providing a free world-class education to anyone anywhere. All of the site's resources are available to anyone. It doesn't matter if you are a student, teacher, home-schooled, principal, adult returning to the classroom after 20 years, or a friendly alien just trying to get a leg up in earthly biology. The Khan Academy's materials and resources are available to you completely free of charge.<sup>5</sup>

## **Comparison**

These systems are cornerstones in the modern age of learning. In the words of John F. Kennedy, “Our progress as a nation can be no swifter than our progress in education. The human mind is our fundamental resource.” Each system strives for progress in education and

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<sup>3</sup> <http://teacherwiki.assistment.org/wiki/About>

<sup>4</sup> <http://www.pearsoned.com/about-us/>

<sup>5</sup> <http://www.khanacademy.org/about>

to bring comprehensive and accessible tools to the everyday classroom. To understand how these learning systems can cultivate the minds of our nation's youth we must analyze each of the systems mentioned above. The discrepancies between each tutoring program provide different strengths and weaknesses that affect student learning.

## **Content**

Content is the driving force behind learning management systems. Moodle has teacher driven content. It gives the teachers the tools to create the questions for them but does not provide standardized questions for use. Pearson provides access to their learning management system for a fee. Access can be gained for a reduced price with the purchase of one of their textbooks. Pearson's online system covers a vast variety of subjects along with the ability for teachers to create questions to supplement the given question; however it is not easily done. Khan Academy is a system in development that currently covers various math and sciences. ASSISTments is that provides skill building sets that have been created by current mathematics teachers in several colleges and high schools mostly based in the New England area. ASSISTments also provides each teacher the ability create their own content.

## **Assigning**

Once the content exists there must be a way to assign it to classes or individuals. Every system implements this differently. Khan Academy does not currently have a system in place for assigning work. Pearson allows you to create a course based on a preexisting subject. Once the class is made materials can be selected and will be able to assign examples from the book along with other similar problems. Within Moodle once the content is created assignments can have set due dates and assignments can be set visible or not within each class. ASSISTments has a similar method of assigning work to students where assignments can be released on a certain date to make it available to students along with a due date for the assignment, this keeps assignments visible.

## **Feedback**

Once the students have the work that they should be working on the next step is to allow them to know how they are progressing. Moodle gives correctness feedback for problems assigned. Khan Academy gives instructional videos regarding the subject. Pearson also provides instructional videos along with the ability to generate a problem similar to problems the student is having trouble with. ASSISTments provides mastery learning which allows the student step by step directions on how to solve the problem.

The student must reach a certain amount of questions correct in a row in order to show understanding and will receive related questions if they are having trouble.

## **Results**

The remaining portion of a learning management system is the ability for the teacher to assess how their students are doing. Moodle provides averages for each student and has the ability to delve into each student's assignment to see how they answered. Khan Academy can show progress reports for skills along with statistics for problems. ASSISTments provides statistics on problem completeness, student averages, how students answered questions, along with the most common incorrect answers. Pearson also allows similar statistics for classes regarding overall averages, student averages, and individual reports on how the student answered within their assignments.

# **Project Description and Goals**

## Overview

Our primary goal is to discern any differences in the mastery of college-ready math skills by students participating in ASSISTments under these two conditions:

- With WPI Skill Builder sets containing variable workloads and step-by-step guidance for reaching the solution or,
- With vanilla sets that create a condition much like an online version of a regular paper worksheet, but with instant correctness feedback.

It is important to note that the ASSISTments homework was given to the students as regular assignment at the teacher's discretion. We felt that gauging the effectiveness of an educational aid is best done when the students were willing participants in the learning process, although if the student failed to complete their assignments the teachers enforced the proper penalties. Thus, we eliminated those who did not complete all testing sets the study from both groups as we cannot determine the effectiveness of the two systems without performance markers. We will discuss this in further detail in a later section.

By gaining more insight in how variable workloads and tutoring strategies affect the learning process, we hope to provide information that can be used to optimize e-learning through ASSISTments. In particular, we want to examine the combined effectiveness of the WPI Skill Builder system and step-by-step help applied to ASSISTments, and whether or not they bring additional improvements in academic success to students studying pre-college level math.

In a way, this experiment is also an investigation of whether or not the mimicking of teacher-student interaction in work assignment and step-by-step tutoring through computerized systems have a significant effect in academic outcome in pre-college math topics.

## Building the ASSISTments

An ASSISTment in our experiment is a math question with correctness feedback and a help system that the student can choose to take advantage of. Here, all ASSISTments for the control and treatment group were generated from the same batch of templates in order to maintain consistency and avoid introducing confounding factors.

This study did not involve the construction of the tools or all the problem sets and templates. ASSISTments is an existing framework that is both free of cost and were tested, adopted, and refined by the ASSISTments team and various educators. Many problem sets and templates were converted from previous studies done on ASSISTments. These sets are recorded in a later section.

## **Building and Releasing the Problem Sets**

Created ASSISTments instances are categorized into sets based on skill so that different sets (and therefore different skills) can be released in a controlled manner in order to maintain a logical order in the problems' skill dependency and difficulty. Detailed description of set creation and design is listed in the Experimental Design section.

The generated problem sets are divided into two symmetric categories covering the same math topics. Mastery Learning sets are the treatment, and worksheet-like vanilla sets are the control. A Mastery Learning set is a set that dynamically allocates more questions up to a daily limit so long as the student does not meet completion requirements of three right in a row. Students also have the option of accessing pre-made tutor that solves the problem step-by-step in exchange for having the problem marked as incorrect. Vanilla worksheet-like sets are completed once all questions have depleted, and does not require the students to demonstrate consistent correctness. The control problem sets are effectively printed problem hand-outs with immediate correctness feedback.

For the University groups, we felt that the students were capable of choosing the skills that they feel are needed first. For the High School groups, we left the release schedule of skill-based problem sets at the discretion the respective instructors, the experiment details can be found in a later section.

## **Blue Group vs. Gold Group**

The Blue and Gold groups were labels for the control and test groups respectively without revealing group purpose to the participants. The names were the school colors of Worcester State University, where the first run was performed. These names were re-used for subsequent trials for simplicity's sake.

We like to clarify that although the test group received treatment that we hypothesized to be superior, the control group's learning experience was not impeded. Both groups were subject to standard educational practices and the control group received what was standard in terms of homework assignments. Both groups improved their math performance after participation.

## **Set Content for Skill**

The skills were chosen in part due to the approach needed to solve them. Here, math problems focusing on mostly arithmetic and simple algebraic concepts were selected because of the straight-forward approaches required to solve them. The heavy use of pattern recognition and adherence to process in these skills makes them somewhat easier to write problems for and tutor compared to more open ended and advanced concepts. Their reputation as foundational skills for



secondary education also gives us an audience that is both plentiful and technologically competent enough not to be hampered by the computerized nature of ASSISTments.

# Experimental Design

## Content

Each of the following problem sets were used in each experiment. The ASSISTments program as mentioned in Section 2 of this paper provided the proper tools to develop the content distributed. Several examples of instantiations of our templates are seen below. Our templates were then used in conjunction with other templates to develop skill building problem sets.

Included with the problem set package that each student received was a warm up problem set, and two test, an evaluation A and an evaluation B test. Also templates each had a blue and a gold copy of the following problem sets. Below the differences among the blue and gold group are described.

## Warm Up Sets

### Blue Warm Up Set

This problem set fit the blue group problem sets that they expected to see throughout their problem sets. It includes four static problems without tutoring hints. The students however were provided with a correctional hint which provided the students simply with the answer to progress to the next template. Unlike the gold group, mastery learning was not used to create the problem sets; rather we took instantiations of the skill building sets, and stripped out the tutoring.

### Gold Warm Up Set

This problem set similarly matched the gold problem sets. It came included with tutoring hints and up to 150 to 200 mastery learning instantiations.

## Evaluation Sets

### Accuplacer Test

This test is described in Study of Accuplacer SKILL BUILDING Experiment 1 section. We took the student's Accuplacer scores and their re-take scores for evaluation.

### Evaluation A

The pre-test that was given to students consisted of 14 problems, which were distributed in linear order.

### Evaluation B

This is the post-test that was given to students. It consisted of 14 problems, which were distributed in random order. The motivation behind changing the post test was in some cases, to

attempt to eliminate the potential for students from cheating. Some experimental environments placed students relatively close together in labs due to lack of personal computers. These students could easily work together with their close by friends to solve the problems during the evaluation. By randomizing the problems, it does not eliminate cheating; however it does make cheating much more difficult.

### Example of a Gold Tutoring System

ASSISTment ID: 236045

[Comment on this question](#)

Find the difference:

$$5\frac{1}{9} - 1\frac{5}{18}$$

Answers must be in the form of a **reduced proper fraction** (example 2/7) or a **mixed number** with a space between the whole number and the fraction (example 3 5/8)

Notice 9 is a factor of 18.

$$5\frac{1}{9} - 1\frac{5}{18}$$

Because 9 is a factor of 18, the least common denominator is 18.

[Comment on this hint](#)

Convert the **first** fraction to an equivalent fraction with a denominator of 18: multiply its numerator and denominator by 18/9=2 (note: 9\*2=18):

$$5\frac{1 \cdot 2}{9 \cdot 2} - 1\frac{5}{18} = 5\frac{2}{18} - 1\frac{5}{18}$$

Since the second numerator is greater than the first, we have to borrow. Borrow 1 from the first whole number, 5, and represent it in fractional form using the common denominator:  $5 = 4 + 1 = 4 + \frac{18}{18}$

$$4\frac{18+2}{18} - 1\frac{5}{18}$$

Next, group the whole number terms and put both fractions together over the common denominator:

$$4\frac{20}{18} - 1\frac{5}{18} = (4-1)\frac{20-5}{18}$$

Now, find the difference in the numerator and in the whole numbers.

[Comment on this hint](#)

Subtracting gives:

$$(4-1)\frac{20-5}{18} = 3\frac{15}{18} = 3\frac{5}{6}$$

Enter 3 5/6

[Comment on this hint](#)

Simplify this rational expression:

$$\frac{x^2 - 3x - 10}{x^2 + 2x - 35}$$

Factor the numerator. The factored numerator is  $(x - 5) * (x + 2)$ .

[Comment on this hint](#)

Factor the denominator. We now have

$$\frac{(x - 5) * (x + 2)}{(x + 7) * (x - 5)}$$

[Comment on this hint](#)

Cancel the common factor of  $(x - 5)$ .

$$\frac{(x - 5) * (x + 2)}{(x + 7) * (x - 5)}$$

Submit  $(x + 2) / (x + 7)$ .

[Comment on this hint](#)

Select one:

- ☐  $(x - 2) / (x - 7)$   
☐  $(x + 5) / (x + 7)$   
☐  $(x + 2) / (x - 5)$   
☐  $(x + 2) / (x + 7)$   
☐  $(-3x - 10) / (2x - 35)$   
☐  $(x - 5) / (x - 7)$

Submit Answer

Show hint 3 of 3

## Algebra Skills

### Computation with Real Numbers

ASSISTment ID: 233291

[Comment on this question](#)

What is  $-2.6 \times 400$ ?

Type your answer below:

Submit Answer

Show Hint 1 of 2

### Order of Operations with Signed Numbers

ASSISTment ID: 225555

[Comment on this question](#)

What is the value of this expression?

$$(9 - 4 + 9)^2$$

Type your answer below:

Submit Answer

Show Hint 1 of 4

### Simplifying Expressions with Addition, Subtraction, Multiplication, Division, and Distribution

ASSISTment ID: 234485

[Comment on this question](#)

Simplify

$$(-9x + 55)x + -7x(x + 7) - 3$$

Select one:

- ☐  $-8x^2 + 62x - 21$
- ☐  $-2x^2 + 58x - 3$
- ☐  $-16x^2 + 6x - 3$
- ☐  $-7x^2 - 49x - 3$

Submit Answer

Show Hint 1 of 4

### Solving Linear Equations

ASSISTment ID: 231981

[Comment on this question](#)

Solve the following system of equations.

$$-6y = -18x - 30$$

$$-3y = 9x - 3$$

What is the value of x?

(If the value of x is not an integer, enter the answer as a fraction, not a decimal)

Type your answer below (mathematical expression):

Submit Answer

Show Hint 1 of 4

### Adding and Subtracting Polynomials

ASSISTment ID: 235885

[Comment on this question](#)

Perform the indicated operation and simplify:

$$(7b + 3) + (b^2 - 4b + 5)$$

Select one:

- ☐  $3b - 8$   
☐  $b^2 - 11b + 2$   
☐  $b^2 + 3b + 8$   
☐  $11b + 2$

Submit Answer

Show Hint 1 of 1

## Multiplying Binomials

ASSISTment ID: 234372

[Comment on this question](#)

Multiply:

$$(2x + 2)(4x + 6)$$

Select one:

- ☐  $2x^2 + 12x + 12$   
☐  $6x^2 + 14x + 8$   
☐  $8x^2 + 12x + 12$   
☐  $8x^2 + 20x + 12$

Submit Answer

Show Hint 1 of 3

## Rational Expressions

ASSISTment ID: 233549

[Comment on this question](#)

Simplify this rational expression:

$$\frac{x^2 - 49}{x^2 + 13x + 42} \div \frac{7 - x}{x + 6}$$

Select one:

- ☒ 1  
☐ -1  
☐ No simplification possible  
☐  $(x-7) / (7-x)$   
☐  $-(x+7)(x+6) / (x^2+13x+42)$

Submit Answer

Show Hint 1 of 3

### Dividing Polynomials

ASSISTment ID: 234164

[Comment on this question](#)

Perform the indicated operation and simplify:

$$\frac{15x^5 - 10x^4}{5x^5}$$

Select one:

- ☐  $-3 + (2/x)$   
☐  $3 - (2/x)$   
☐  $-3 + 2x$   
☐  $15 - (10/x)$

Submit Answer

Show Hint 1 of 1

### Greatest Common Monomial Factor



ASSISTment ID: 201598

[Comment on this question](#)

What is the greatest common factor between the two numbers 12, 92?

Submit Answer

Show Hint 1 of 3

### Factoring Difference of Squares

ASSISTment ID: 228282

[Comment on this question](#)

**Factor** the following polynomial:

$$49x^2 - 36$$

Once you have the polynomial factored enter one of the two factors

\_\_\_\_\_

Type your answer below (mathematical expression):

Submit Answer

Show Hint 1 of 4

### Factoring Trinomial with Leading Coefficients of One

ASSISTment ID: 228493

[Comment on this question](#)

**Factor** the following polynomial:

$$x^2 + 16x - 105$$

Once you have the polynomial factored enter one of the two factors

\_\_\_\_\_

Type your answer below (mathematical expression):

Submit Answer

Show Hint 1 of 4

### All Factoring Mix Greatest Common Factor, Difference of Squares, Trinomials

ASSISTment ID: 228642

[Comment on this question](#)

What is the *greatest common factor* shared by the monomials in the following expression?

$$3x^4 - 1x^3 + 2x^2$$

Use the **carrot** symbol for exponents: ( $2x^3 = 2x^3$ )

If there is no greatest common factor, type in 1.

\_\_\_\_\_

Type your answer below (mathematical expression):

Submit Answer

Show Hint 1 of 3

### Write Linear Equation from Slope and Y-Intercept

ASSISTment ID: 196598

[Comment on this question](#)

A bank account currently has a balance of \$9516.

Each month, \$27 is withdrawn to pay for a monthly magazine subscription. No other transactions take place.

Assume the number of months is your independent variable (x) and the balance is your dependent variable (y).

Find 'y', the balance in the bank account after x months

Write your equation in the form  $y = \underline{\hspace{2cm}}$ .

\_\_\_\_\_

Type your answer below (mathematical expression):

Submit Answer

Show Hint 1 of 3

### Linear Equations from a Situation

ASSISTment ID: 109059

[Comment on this question](#)

Samantha starts a job at McDonald's. Samantha gets dropped off by her parents at the start of her shift but she takes a taxi home that costs her 13 dollars. Samantha gets paid  $d$  dollars for one night of work. After taking into account her taxi ride, write an expression for how much she makes in one night.

Type your answer below (mathematical expression):

Submit Answer

Show Hint 1 of 2

### Systems of Equations

ASSISTment ID: 233162

[Comment on this question](#)

Solve the following system of equations.

$$-4y = -8x - 16$$

$$-6y = 24x - 24$$

What is the value of  $x$ ?

(If the value of  $x$  is not an integer, enter the answer as a fraction, not a decimal)

Type your answer below (mathematical expression):

Submit Answer

Show Hint 1 of 4

### Factoring to Solve Quadratic Equations

ASSISTment ID: 217940

[Comment on this question](#)

Solve the equation:

$$(x - 1) * (x - 9) = 0$$

The solutions are

Select one:

- ☐ -1, 9
- ☐ 1, 9
- ☐ 1, -9
- ☐ -1, -9

Submit Answer

Show Hint 1 of 3

### Square Roots of Algebraic Expressions

ASSISTment ID: 236690

[Comment on this question](#)

Multiply or divide. Simplify if possible. All variables represent nonnegative real numbers.

$\sqrt{e}$  is the square root of e, where e can be any expression.

$$\sqrt{40x^2y^3} \cdot \sqrt{64x^3y}$$

Select one:

- ☐  $16x^2y^2\sqrt{10x}$
- ☐  $16\sqrt{10xxy}$
- ☐  $40\sqrt{4x^2y^3}$
- ☐  $x^2y^2\sqrt{10xy}$

Submit Answer

Show Hint 1 of 1

## Arithmetic Skills

### Equivalent Fractions

ASSISTment ID: 161219

[Comment on this question](#)

Convert the following to an improper fraction:

$$16 \frac{14}{17}$$

Submit Answer

Show Hint 1 of 3

### Adding and Subtracting Proper Fractions

ASSISTment ID: 226051

[Comment on this question](#)

Simplify the following fraction into its lowest terms:

Remember to write your answer as a mixed number with a space between the integer and the fraction.

$$3 \frac{21}{51}$$

\_\_\_\_\_  
Type your answer below:

Submit Answer

Show Hint 1 of 3

### Adding and Subtracting Mixed Numbers

ASSISTment ID: 236635

[Comment on this question](#)

Find the difference:

$$4\frac{1}{2} - 1\frac{7}{8}$$

Answers must be in the form of a **reduced proper fraction** (example 2/7) or a **mixed number** with a space between the whole number and the fraction (example 3 5/8)

Type your answer below:

Submit Answer

Show Hint 1 of 3

### Multiplying and Dividing Proper Fractions

ASSISTment ID: 229743

[Comment on this question](#)

Calculate the product of the following two fractions and make sure your answer is in **SIMPLEST FORM!**

$$\frac{15}{28} \times \frac{4}{15}$$

Type your answer below:

Submit Answer

Show Hint 1 of 4

### Multiplying and Dividing Mixed Numbers

ASSISTment ID: 229869

[Comment on this question](#)

Calculate the quotient of the following and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 6 3/4.

$$3\frac{5}{8} \div \frac{4}{11}$$

Type your answer below:

Submit Answer

Show Hint 1 of 5

### Addition and Subtraction Positive Decimals

ASSISTment ID: 208597

[Comment on this question](#)

What is  $87.15 - 8.81$ ?

Submit Answer

Show Hint 1 of 3

### Multiplying and Dividing Decimals

ASSISTment ID: 208597

[Comment on this question](#)

What is  $87.15 - 8.81$ ?

Submit Answer

Show Hint 1 of 3

## Multiplication and Division by Powers of 10

ASSISTment ID: 225319

[Comment on this question](#)

What is  $20 \times 100$ ?

\_\_\_\_\_

Type your answer below:

Submit Answer

Show Hint 1 of 3

## Percents

ASSISTment ID: 232795

[Comment on this question](#)

A mountaineer is making his way up a cliff. About 46 feet up, he looks up and estimates that he's climbed about 63% of the cliff. Assuming he's correct, how high is the cliff? Round to the nearest foot.

\_\_\_\_\_

Type your answer below (mathematical expression):

Submit Answer

Show Hint 1 of 3

## Proportion - Ratio - Rates



ASSISTment ID: 230849

[Comment on this question](#)

Find the value of  $y$  that makes the fraction equivalent.

$$\frac{y}{11} = \frac{3}{6}$$

If necessary, round your answer to the nearest tenth.

\_\_\_\_\_

Type your answer below (mathematical expression):

Submit Answer

Show Hint 1 of 3

### Conversion of Fractions, Decimals, and Percents

ASSISTment ID: 198699

[Comment on this question](#)

Convert 45.59 into a **simplified mixed number**.

Don't forget to separate the integer and fraction parts with a space!

Submit Answer

Show Hint 1 of 3

### Exponent, Square Roots

ASSISTment ID: 229063

[Comment on this question](#)

What is the **standard form** of the following number?

$6^2$

Type your answer below:

Submit Answer

Show Hint 1 of 3

### Word Problems

ASSISTment ID: 237631

[Comment on this question](#)

Below are the number of texts Andrew sent and received each month over the past few months.

25, 80, 66, 55, 18, 34, 47, 5, 30

What's the **mean** texts per month for Andrew?

Type your answer below:

Submit Answer

Show Hint 1 of 3

### Rounding

ASSISTment ID: 208545

[Comment on this question](#)

Round the following number to the **tens place**

513

Submit Answer

Show Hint 1 of 3

### Order of Operations

ASSISTment ID: 225506

[Comment on this question](#)

What is the value of this expression?

$$(-7 + 10)^2$$

Type your answer below:

Submit Answer

Show Hint 1 of 3

# **Study of Accuplacer SKILL BUILDING: Experiment 1**

## **What is Accuplacer?**

The ACCUPLACER is used to test a student's skills in math, English, and writing based upon their adaptive learning skill set. This program is a guide to help Worcester State University students choose an appropriate course load. Many students are unsure of what course they should be in, and often times result in the wrong skill set. For example, a student may enter college algebra and not have the necessary skills to perform well in the course. A tumbling effect quickly may occur where a student fails, or drops out of the class due to the lack of skills needed in that course. The ACCUPLACER is an attempt to prevent students from entering a course that they are not prepared for<sup>6</sup>.

## **Why Accuplacer?**

A major benefit to students who must take the Accuplacer is the adaptive question basis. The questions in the computerized examination depend on the way a student responds to the previous question. Since the Accuplacer is adaptive, the results are tailored to the student, and gives the student as well as the advisor an accurate report of areas the tester must work on. The conception behind the Accuplacer is that, “**Once** you identify your academic strengths and needs, you can get the help you need to improve undeveloped skills before they can interfere with your learning.”

## **What problems are the students facing?**

Some students enter their first college math course ill-prepared which in turn relates to students struggling severely in the course and in worst cases, dropping out of the course. There are other students who have circumvented these core math classes and waited until the junior and senior year to take a fundamental math course. These students suffer a double penalty of not learning the skill set in the previous educational institution, and not touching

## **Accuplacer Effectiveness**

How well can students improve their performance on the Accuplacer if they are WPI ASSISTment Skill Builder prepared, compared to students who use generic Accuplacer techniques to prepare? Obviously there may be other contributing factors to a student's failure; however we simply address the student's college preparedness in this study.

## **Hypothesis**

---

<sup>6</sup> <http://www.worcester.edu/AcademicSuccess/Shared%20Documents/Accuplacer.aspx>

Students will perform “better” on the Accuplacer if they are WPI Accuplacer Skill Builder prepared in using the ASSISTments tutoring system.

## **Method**

### ***Setup***

This experiment will utilize the Accuplacer test by randomly selecting (experimental group) 10(20) students out of 20(40) students that will retake the test after being WPI Accuplacer prepared. The remaining students (control group) will prepare to retake the test using ASSISTments, without tutoring. This control group are expected to prepare in a generic way per-usual.

Test mode pre-test on the skills in question. How the control group works through the problems. If the experimental group receives a better understanding of problems answered incorrectly. How well do the students score after retaking the Accuplacer? Treatment will have paper worksheets plus skill builders 3 right in a row, and tutoring. The control group will have paper worksheets, and they will get problem sets for just for problems in a problem set and no tutoring (correctness feedback only). "Fake" Accuplacers were built for the control group. Some students opted out to retake the ACCUPLACER test and therefore we disregarded these students in our analysis.

### ***Experimental Environment***

#### **Worcester State**

Experimental: Group of students using the Accuplacer

Control: Students will use ASSISTments; however they will not receive any tutoring. These students only receive the Accuplacer ASSISTment questions.

## **Study of High School Students/Middle: Experiment 2**

We duplicated our December Accuplacer experiment at the end of January, 2012 to potentially produce other results that support our overall claim that ASSISTments, if correctly utilized can effectively improve a student's skill set. In this trail, we ran the experiment an additional three times throughout high schools in Worcester, MA. The schools who opted in this experiment were Doherty High School led by Kathleen O'Leary, Sullivan Middle School led by Michele Fulk, and Clairmont Academy led by Adelina Zaimi. There are minor discrepancies between the three high schools, all which will be pointed out individually in the experimental environment section.

### **Hypothesis**

Middle school and High school students will be more prepared for typical college readiness skills by using the ASSISTments tutoring system.

### **Method**

#### ***Setup***

Each teacher submitted a list of students that would be participating in the experiment. Mrs. Zaimi submitted five classes, Mrs. O'Leary submitted one class, and Mrs. Fulk submitted two classes that she wanted to participate in the experiment. We then sorted the students in order of their current overall grade percentage and labeled every other student with a blue or gold tag. This tag was used as an identifier for the students to join the correct class, blue or gold. Once the students correctly joined their online class, they then were able to take the appropriate warm up problem set, followed by the Evaluation A. Upon completion of the Evaluation A, the student was permitted to run through the remaining problem sets to practice. The students were given roughly three weeks to practice before Evaluation B.

#### ***Experimental Environment***

##### **Doherty High School**

The students who participated in this experiment initially were placed into the Doherty High School library to use the lab computer equipment. The students there were advised to continue working at home to make progress. Several other occasions after, we met with Mrs. O'Leary and her class to give them progress reports, feedback, motivational speeches, and well as help with the actual content.

##### **Clairmont Academy**

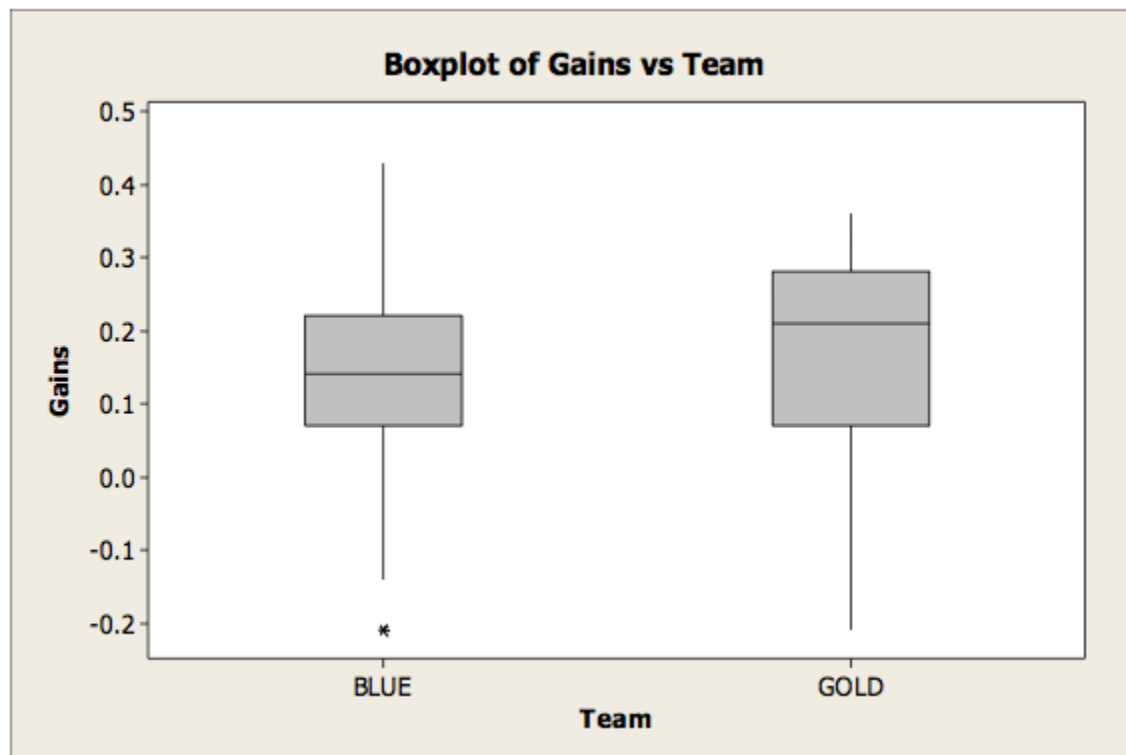
Mrs. Zaimi met her students in a computer lab. Only a few students had ever made ASSISTments accounts before so we began by having them go to [www.ASSISTments.org](http://www.ASSISTments.org). Since there was no projector in the room the students had to just follow the directions to make

their accounts. Cristina did this with the first two periods while Ms. Zaimi took over for the rest. We had a list of the student's names and had to call them out to tell them who was in the blue group and who was in the gold group. The students mostly made their accounts without much intervention from the instructors and they go to work on the pre-test. As they finished the pre-test they got to work on the two skill assignments. For the most part the students completed their work individually.

### **Sullivan High School**

The students did the pre-test and the assignments at home for the most part. Those students who do not have internet access at home used school library computers before school and during lunch. This also means that some students used their own laptops while other students used school resources such as the lab computers. The Pre-test was taken at the student's discretion of time, while the post test was taken at school all at the same time. For simplicity the students were able to work on ASSISTments homework both, at school and at home. Mrs. Fulk believes that it unlikely that they would ask for help on the problem sets. There grade was based on getting the problem sets done on time, not how well they did. We assume that the students therefore worked independently without any suspicion of academic dishonesty.

## Adelina class data



### Two-Sample T-Test and CI: Gains, Team

Two-sample T for Gains

Team	N	Mean	StDev	SE Mean
BLUE	30	0.129	0.147	0.027
GOLD	25	0.158	0.154	0.031

Difference =  $\mu$  (BLUE) -  $\mu$  (GOLD)

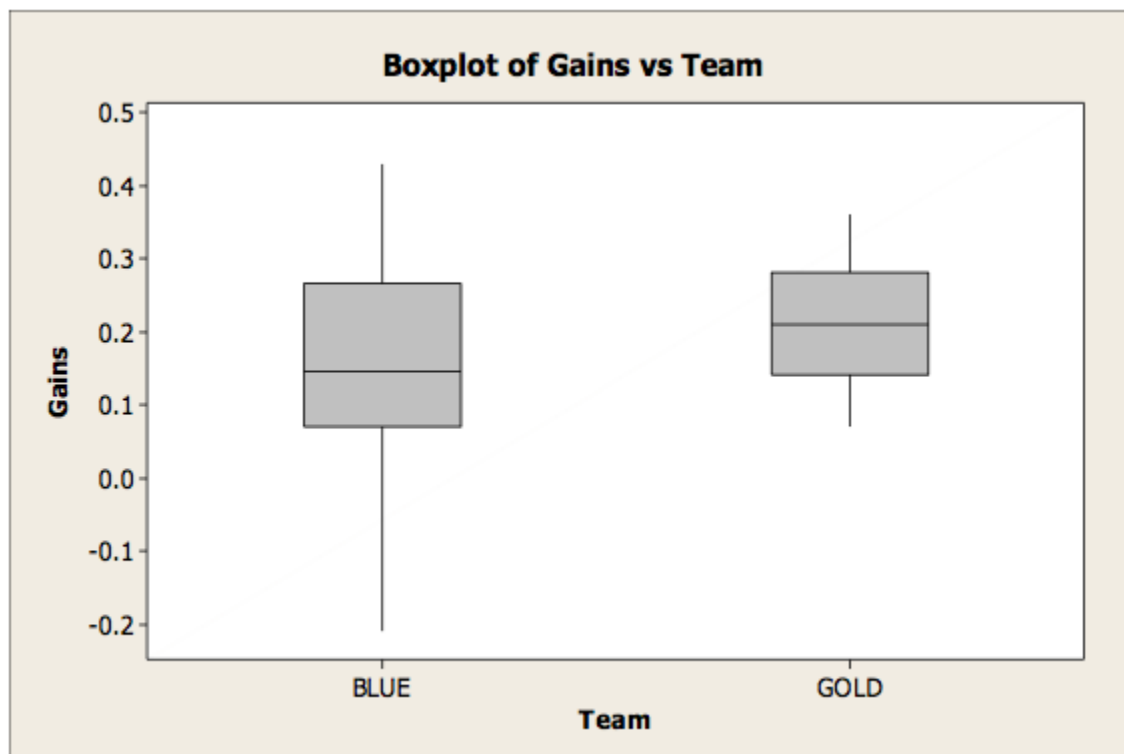
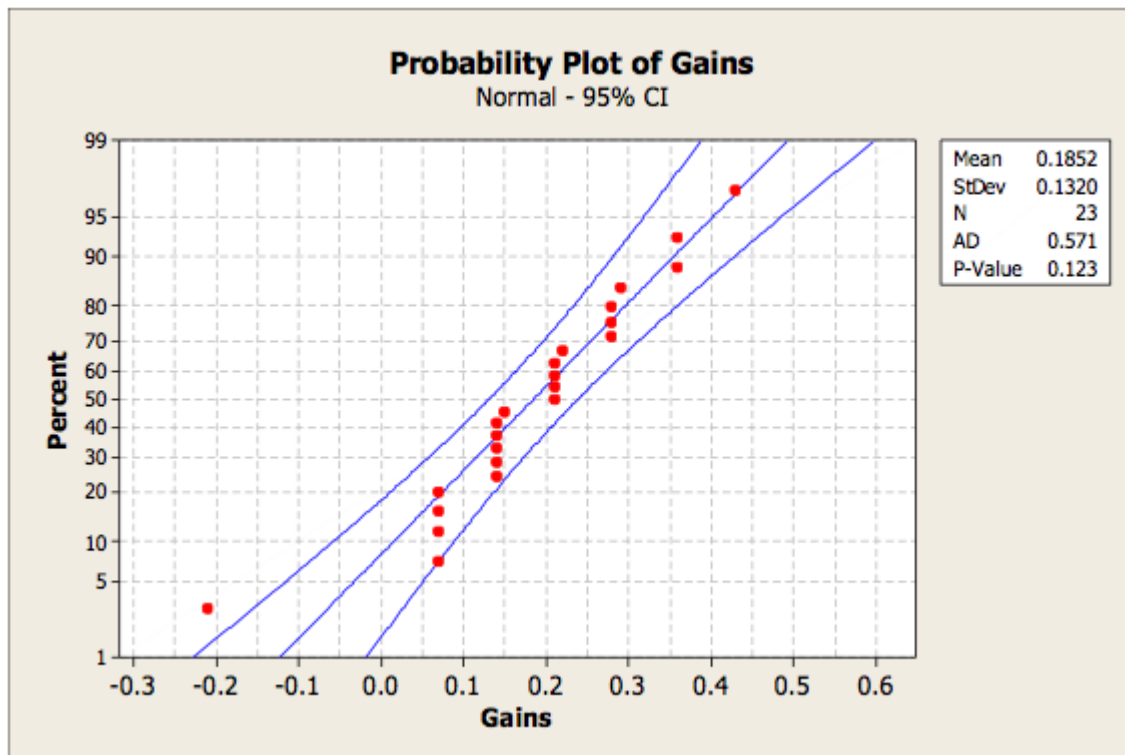
Estimate for difference: -0.029000

95% CI for difference: (-0.110968, 0.052968)

T-Test of difference = 0 (vs not =): T-Value = -0.71 P-Value = 0.481 DF = 50



Adelina : low knowledge kids – pretest  $\leq 50\%$



Two-Sample T-Test and CI: Gains, Team

#### Two-sample T for Gains

Team	N	Mean	StDev	SE Mean
BLUE	12	0.155	0.157	0.045
GOLD	11	0.2182	0.0940	0.028

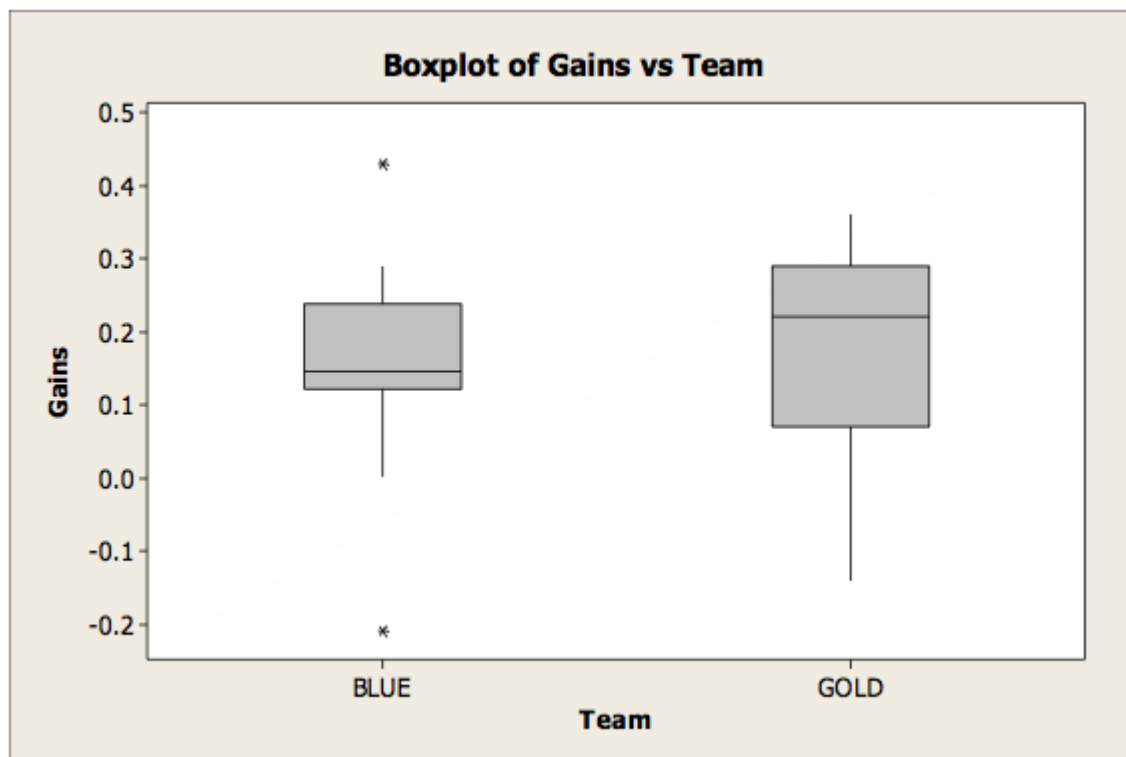
Difference =  $\mu$  (BLUE) -  $\mu$  (GOLD)

Estimate for difference: -0.063182

95% CI for difference: (-0.175629, 0.049265)

T-Test of difference = 0 (vs not =): T-Value = -1.18 P-Value = 0.253 DF = 18

Adelina: Student who did 3 or more problems in all 15 problem sets



#### Two-Sample T-Test and CI: Gains, Team

##### Two-sample T for Gains

Team	N	Mean	StDev	SE Mean
BLUE	22	0.166	0.128	0.027
GOLD	15	0.168	0.160	0.041

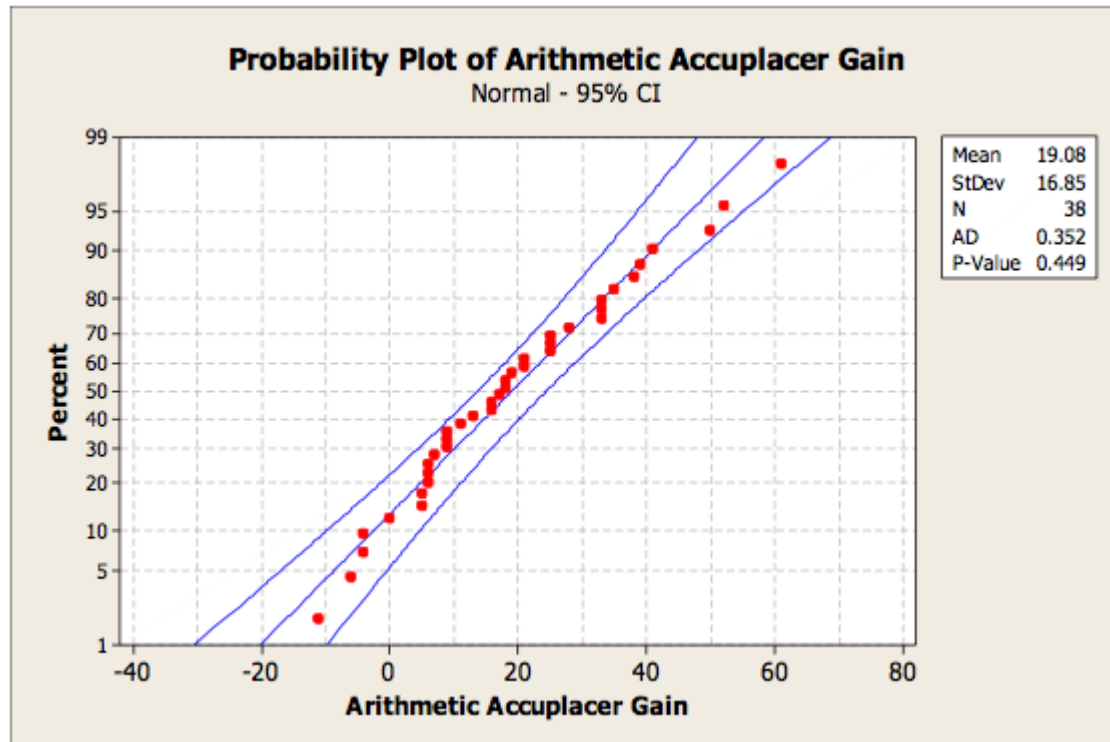
Difference =  $\mu$  (BLUE) -  $\mu$  (GOLD)

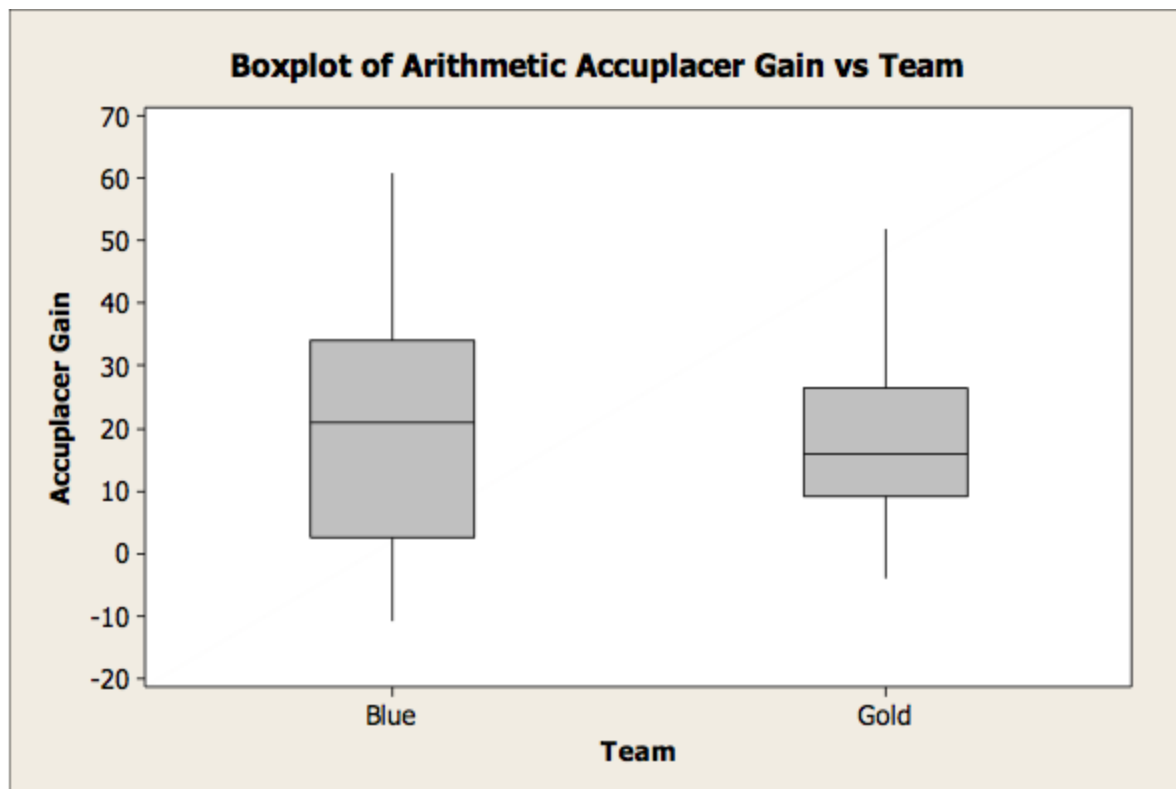
Estimate for difference: -0.001636

95% CI for difference: (-0.103442, 0.100169)

T-Test of difference = 0 (vs not =): T-Value = -0.03 P-Value = 0.974 DF = 25

## WSU - Arithmetic Accuplacer





## Two-Sample T-Test and CI: Arithmetic Accuplacer Gain, Team

Two-sample T for Arithmetic Accuplacer Gain

Team	N	Mean	StDev	SE Mean
Blue	17	19.8	20.6	5.0
Gold	21	18.5	13.6	3.0

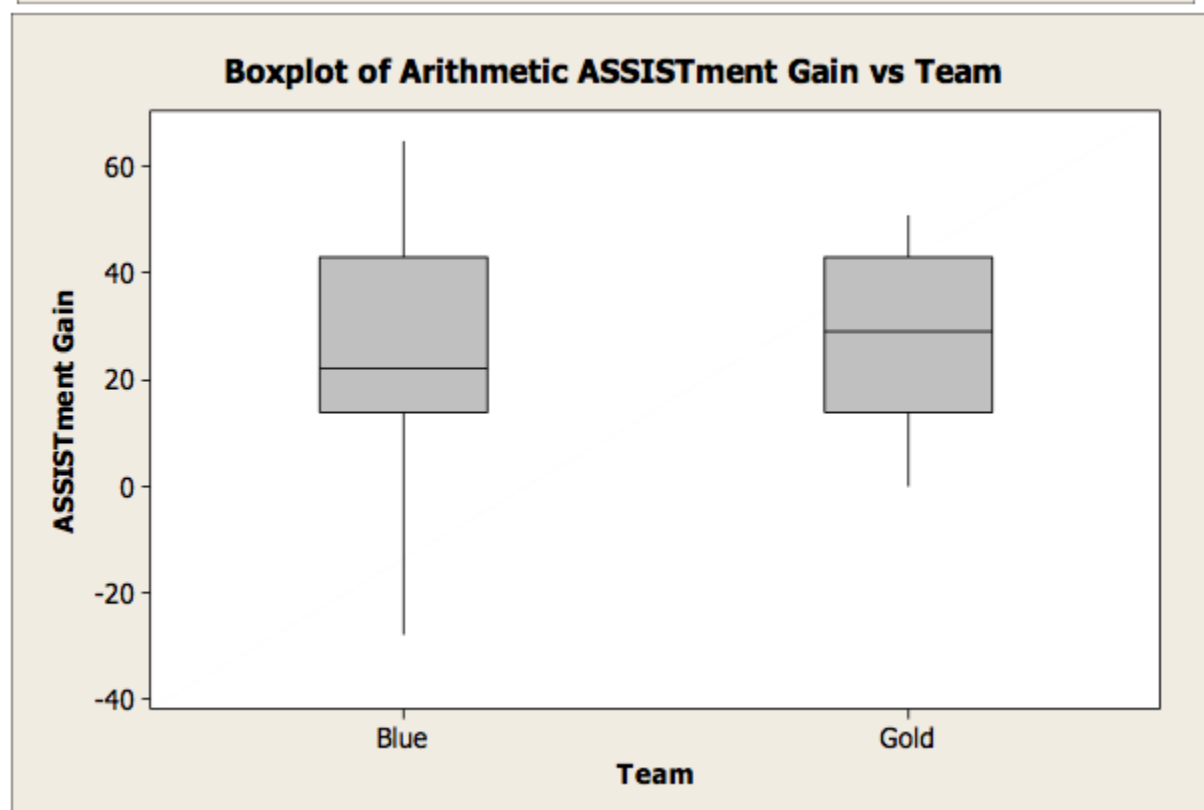
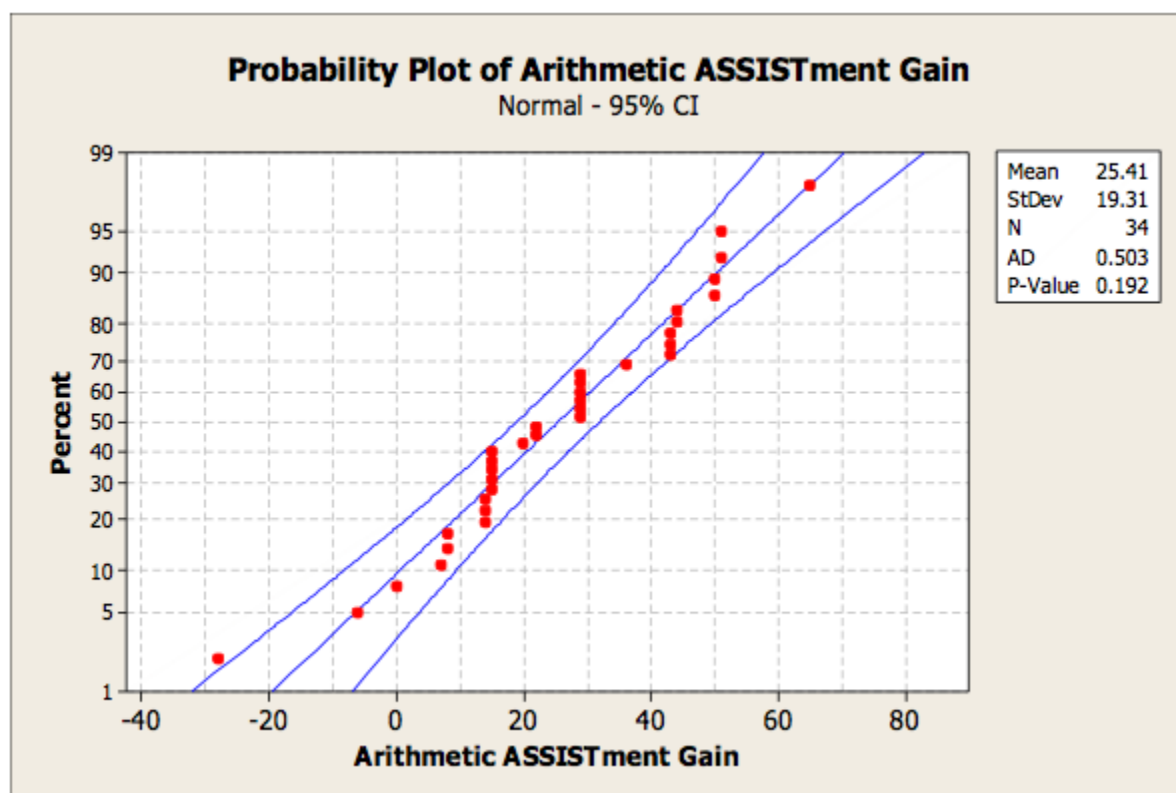
Difference =  $\mu$  (Blue) -  $\mu$  (Gold)

Estimate for difference: 1.24090

95% CI for difference: (-10.70711, 13.18890)

T-Test of difference = 0 (vs not =): T-Value = 0.21 P-Value = 0.833 DF = 26

WSU - Arithmetic ASSISTments



## Two-Sample T-Test and CI: Arithmetic ASSISTment Gain, Team

Two-sample T for Arithmetic ASSISTment Gain

Team	N	Mean	StDev	SE Mean
Blue	15	24.3	23.5	6.1
Gold	19	26.3	15.9	3.6

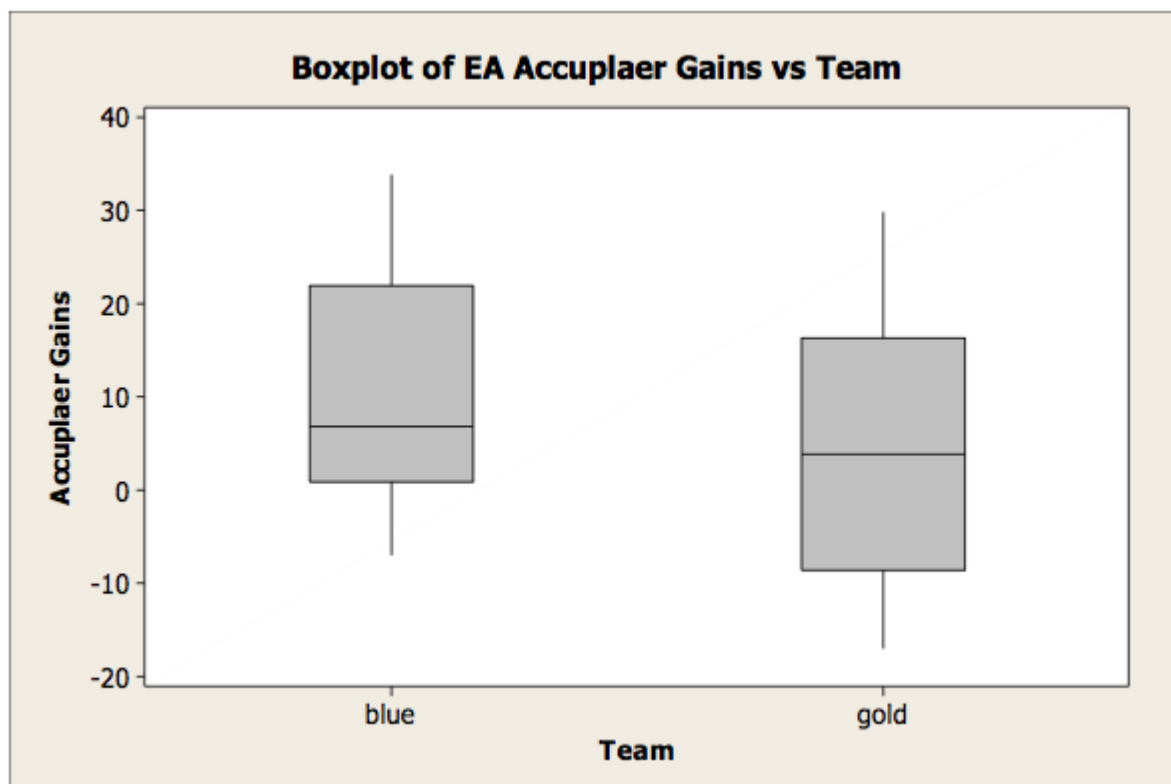
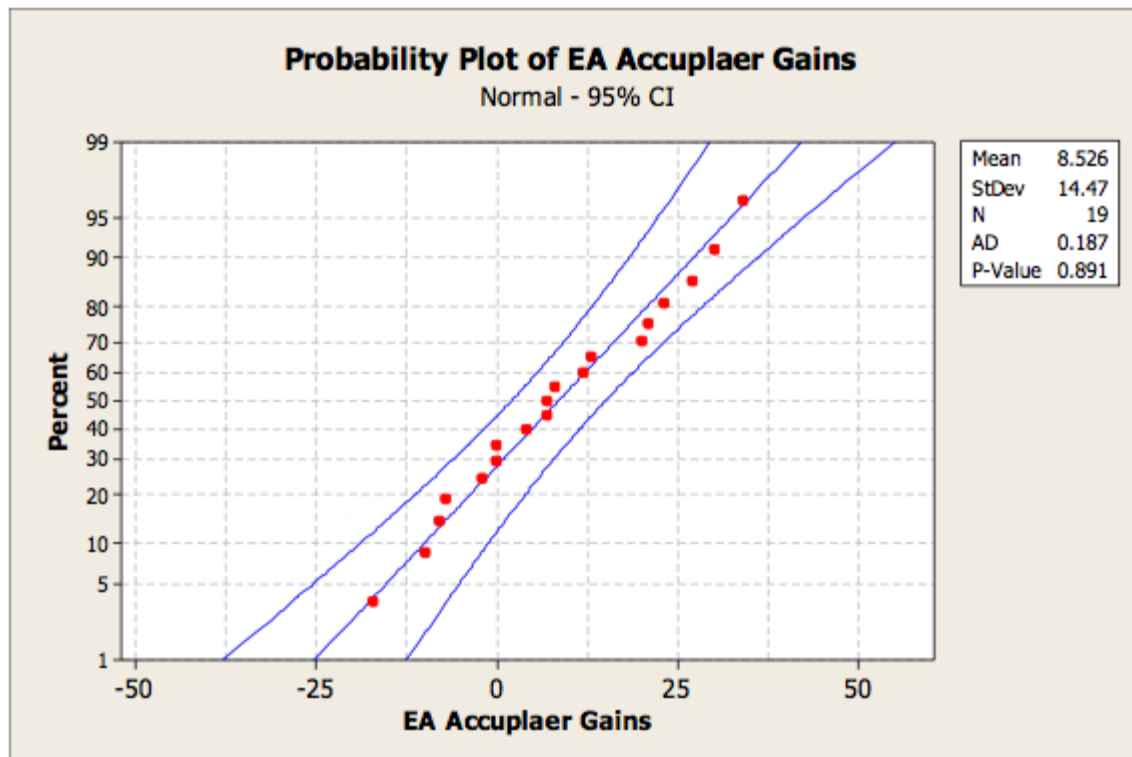
Difference =  $\mu$  (Blue) -  $\mu$  (Gold)

Estimate for difference: -2.04912

95% CI for difference: (-16.68933, 12.59109)

T-Test of difference = 0 (vs not =): T-Value = -0.29 P-Value = 0.775 DF = 23

WSU - Elementary Algebra Accuplacer



Two-Sample T-Test and CI: EA Accuplacer Gains, Team

#### Two-sample T for EA Accuplacer Gains

Team	N	Mean	StDev	SE Mean
blue	9	11.9	13.3	4.4
gold	10	5.5	15.5	4.9

Difference =  $\mu$  (blue) -  $\mu$  (gold)

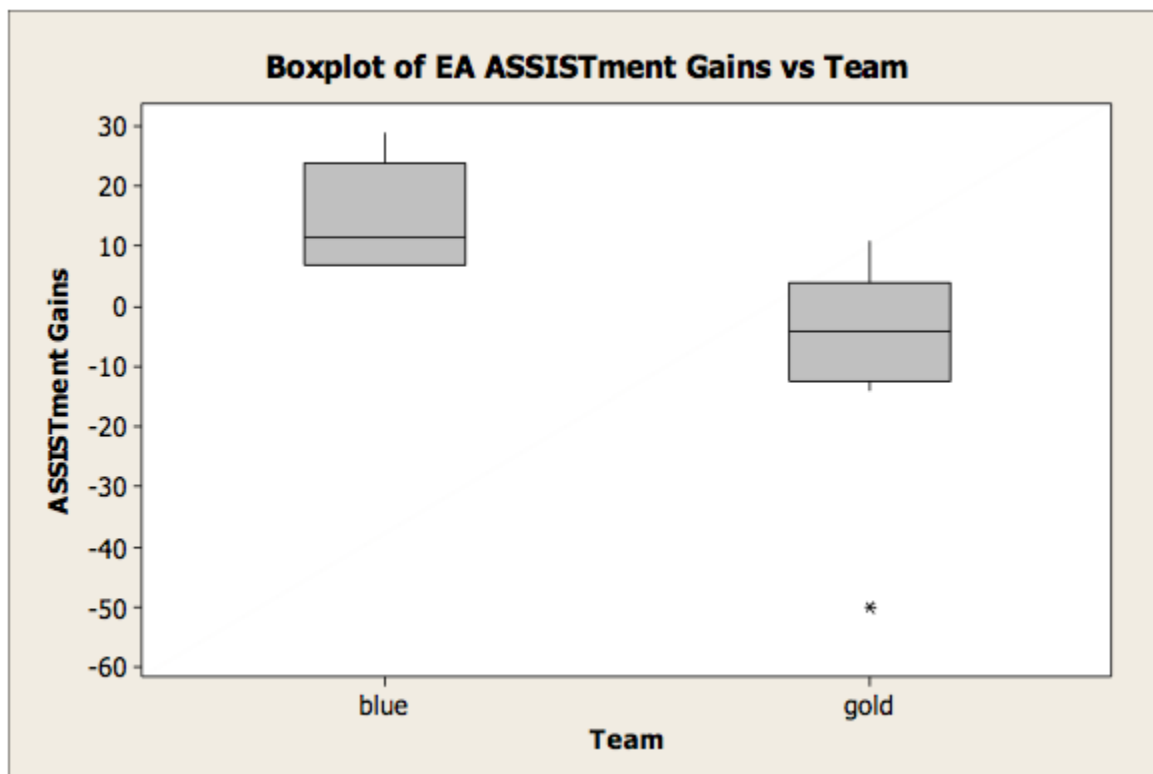
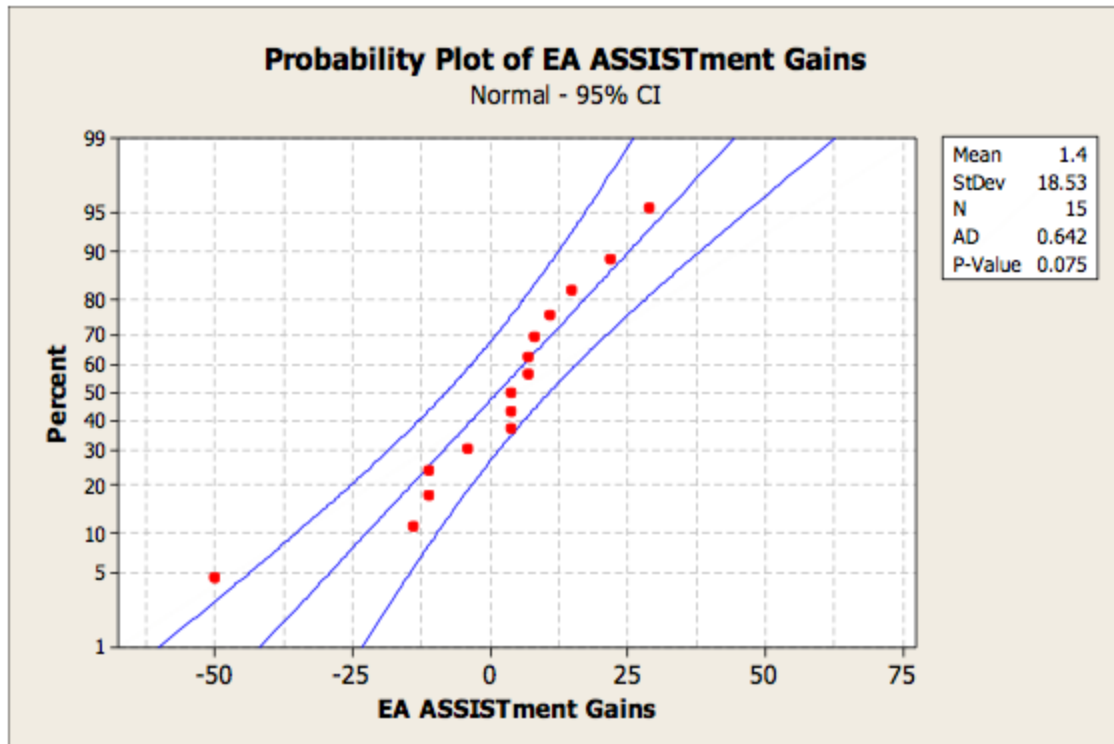
Estimate for difference: 6.38889

95% CI for difference: (-7.62426, 20.40204)

T-Test of difference = 0 (vs not =): T-Value = 0.97 P-Value = 0.348 DF = 16

WSU - Elementary Algebra ASSISTments





Two-Sample T-Test and CI: ASSISTment Gains, Team

Two-sample T for ASSISTment Gains

Team	N	Mean	StDev	SE Mean
blue	6	14.67	9.18	3.7
gold	9	-7.4	18.1	6.0

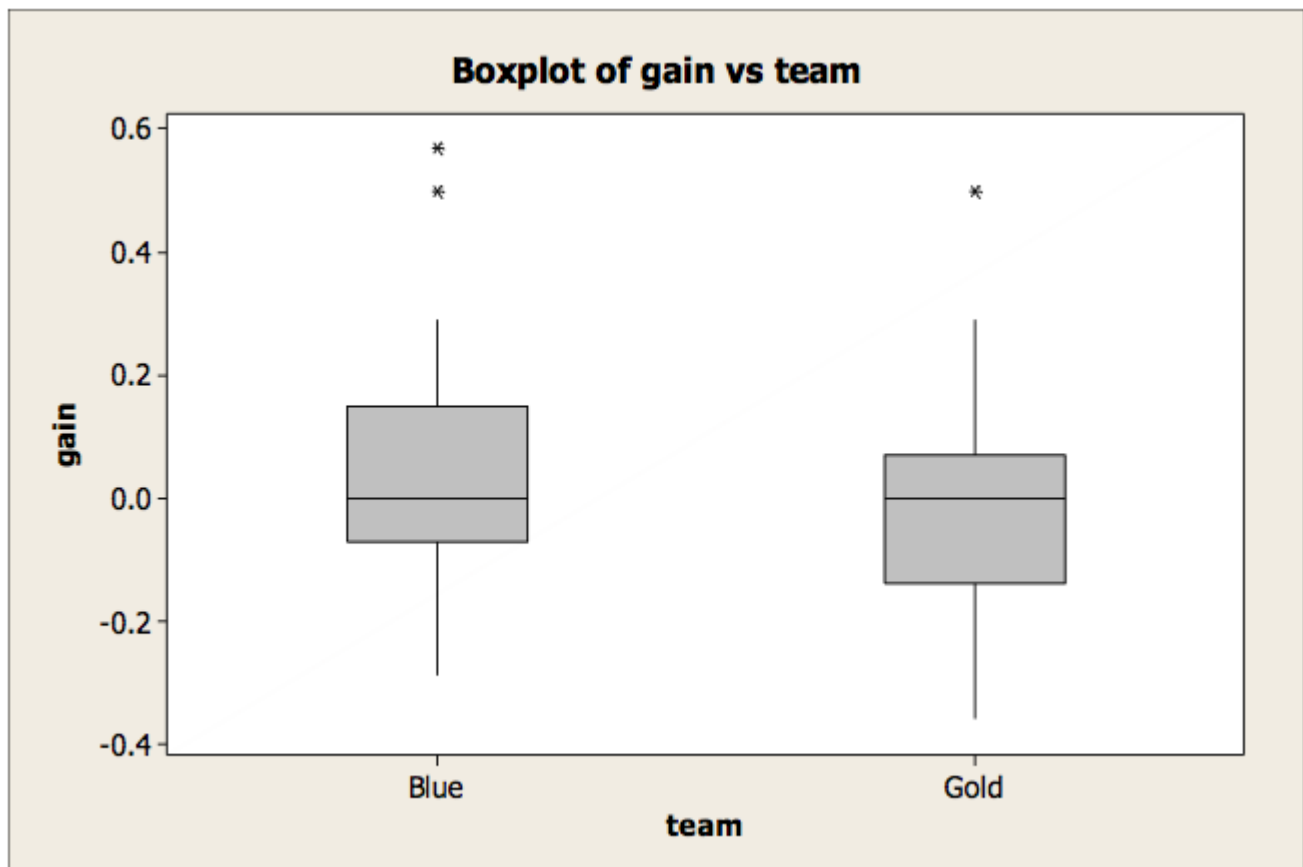
Difference =  $\mu$  (blue) -  $\mu$  (gold)

Estimate for difference: 22.1111

95% CI for difference: (6.6290, 37.5933)

T-Test of difference = 0 (vs not =): T-Value = 3.11 P-Value = 0.009 DF = 12

## Fulk Data - Full data set



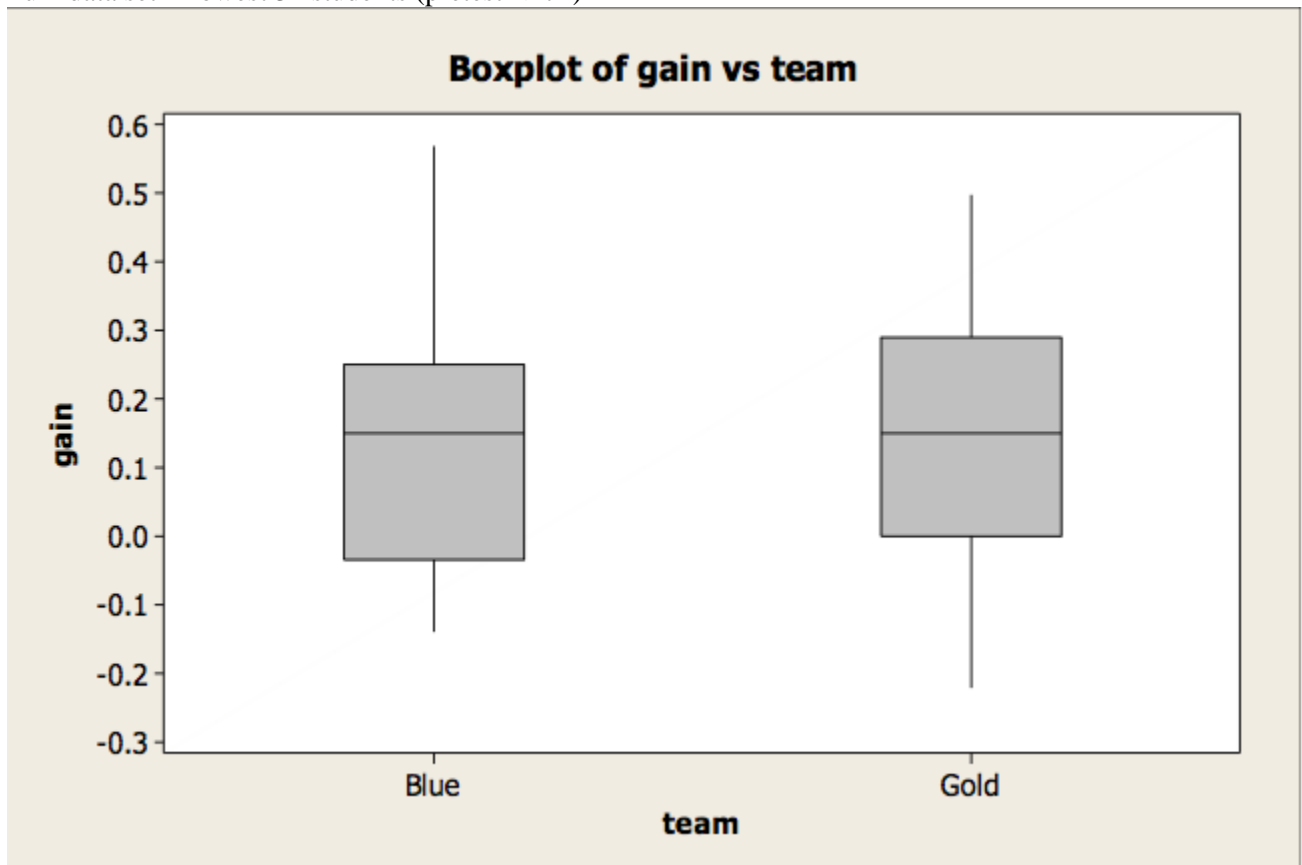
Two-Sample T-Test and CI: gain, team

Two-sample T for gain

team	N	Mean	StDev	SE Mean
Blue	47	0.021	0.177	0.026
Gold	46	-0.004	0.174	0.026

Difference =  $\mu$  (Blue) -  $\mu$  (Gold)  
 Estimate for difference: 0.025624  
 95% CI for difference: (-0.046659, 0.097908)  
 T-Test of difference = 0 (vs not =): T-Value = 0.70 P-Value = 0.483 DF = 90

Fulk data set - Lowest 31 students (pretest  $\leq 71$ )



## Results for: Worksheet 2

Two-Sample T-Test and CI: gain, team

Two-sample T for gain

team	N	Mean	StDev	SE Mean
Blue	17	0.150	0.192	0.047
Gold	14	0.140	0.189	0.050

Difference =  $\mu$  (Blue) -  $\mu$  (Gold)  
 Estimate for difference: 0.010000

95% CI for difference: (-0.130797, 0.150797)

T-Test of difference = 0 (vs not =): T-Value = 0.15 P-Value = 0.885 DF = 28

## **Accuplacer Outcome**

The data above shows that in the arithmetic sections the gains are normal in the probability plots and also the gains were equal. This means that the box plots show no difference. The T-Test also support this conclusion to show there is no difference between the blue group and the gold groups. In the elementary algebra section, there was not much variance in the box plots. We derived a p-value of .348 which means there is no difference between the Accuplacer blue and gold group test. The ASSISTments test showed that the p-value was very small, and also showed that the blue group had a higher increase than the gold group which contends our hypothesis.

## **Impact of Tutoring on Students of Different Averages**

Data collected from Ms. Fulk's class afforded us with a sample large enough to collect meaningful statistical information from after isolating low-performing students.

After data analysis, we cannot conclude that lower-scoring students gained any additional mathematical knowledge with Mastery Learning compared to vanilla sets with correctness feedback. The difference between the control and treatment groups remained statistically insignificant even when low-performers were analyzed. Although ASSISTments do raise the performance of low-performers by a higher margin than the class average, it only needs a few questions and correctness feedback to do so. Mastery Learning does not make a positive or difference here either.

## **Tutoring Strategy Impact on Learning Based on Gain**

The addition of our optional step-by-step problem tutoring to correctness feedback does not statically improve our gains in all data sets.

## **Comparison of instructor resource versus computerized tutoring**

In the Worcester State University experiment, the instructor reported a much higher level of instructor-student email interaction in the control group compared to the test group. Because of this, there was a significant positive gap between the control group and treatment group.

We feel that this affirms the notion that students benefit from individual interactions with the instructor, even though a computerized medium.

# Conclusion

## Agreement with hypothesis

The data collected did not agree with our initial hypothesis.

Comparison of Mastery Learning and vanilla ASSISTment score gains from all experiment data sets had P-values significantly above 0.05 with the exception of one, which actually showed that Mastery Learning created a lower gain than plain ASSISTments sets, contrary to our hypothesis.

Because of this, we are certain that the Mastery Learning did not have a significant advantage over worksheet-like systems in terms of improving of student's ability to become college ready in math skills. This conclusion was drawn from data collected from both experiments in the Accuplacer study.

## Interpretation of data and implied causality

Our initial hypothesis stemmed from the assumption that the same worksheet will not be able to accommodate all skill levels and that Mastery Learning will keep delegating problems to low-performance students until they have mastered the particular math skill while providing them with step-by-step guidance to present and clarify concepts. This would facilitate the students which were having difficulties in terms of class performance by giving extra practice and explaining procedure to pupils who fail to demonstrate topic mastery.

However, in the actual experiment, students with higher skill were exposed to a similar amount of problems as those in the treatment group only had to enter three correct questions in a row and those in the control set only had to complete four problems. The availability of step-by-step instructions did not seem to have a significant either. Also, there was no significant positive gap between the Mastery Learning and ASSISTments in lower-performing students, suggesting that the extra workload did not increase skill level.

Eliminating that, we are left with the prospect that a few questions representative of a skill with instant correctness feedback is just as effective as our implementation variable workloads and incremental tutoring.

## Nuisance factors

It should be noted that in the Worcester State study, the control group received significantly more instructor email assistance compared to the treatment group. This may cause a narrowing in the improvement gap between the two groups.

It could also be interpreted that the students received the most help from the step-by-step help system more than the Accuplacer system or that the control group was not given enough questions in the Blue sets. However,

Finally, based on instructor feedback, we have little evidence to suggest academic dishonesty and any skewing of data because of it.

## **Experiment post-mortem**

The comparatively unremarkable student reaction to Mastery Learning reveals several potential pitfalls in the assumptions and designs that were made in this experiment. For one, we failed to notice that, although our intention was to create a system that would match the educational process, we did not put adequate emphasis on human-computer interaction. A scripted hint system is closer to a textbook than teacher feedback, especially when it is presented as text and diagrams. The additional text can appear confusing or even intimidating to students who already have established an attitude towards blocks of words and formulas in their traditional math education. Assigning more problems based on a general view of mathematical skills by itself may be too superficial when error lies in the reasoning step that may not be required in all instances of that problem.

Our experiment design did not address all the subtleties of an extremely complex and even stochastic process. There were elements pertaining to usability and the reasoning process that were simply not encountered and addressed in the initial design. It is safe to say that there is a misalignment in the sophistication of the human learning process and the simulation of personal interaction we designed to match it.

Hopefully, this study will shed light on how to effectively maximize education return with ASSISTments.

# Appendix

## Arithmetic Problem Sets

### Warm Up

#### Problem Set "Warm Up Gold" id:[38040]

##### 1) Assignment #237139 '237139 - Welcome to Assist...'

Welcome to Assistments! This will show you what to expect.

Example:

What is  $2 + 2$ ?

Click on Show Hint 1 below.

Fill in:

✓ 4

Hints:

•

If you click on Show Hints it marks the question as wrong.

Click on Show Hint **ONLY** if you are stuck and want to know the answer.

The answer is 4. Type 4 and click submit.

---

##### 2) Assignment #237157 '237157 - The last example ...'

The last example you had to input the answer.

Here is an example of multiple choice:

What does  $2 + 2 =$  ?

Select the correct answer and continue.

Multiple choice:

✗ 1

✗ 2

✗ 3

✓ 4

Hints:

• Remember, if you click show hints, this question will be marked as wrong, however it will tell you the answer.

The answer to this problem is 4. Select 4 and click submit.

---

##### 3) Assignment #237158 '237158 - The last two exam...'

The last two examples will be closer to actual questions you will have.

← → ↺ ↻ 🔍 🗖

What is 21 divided by 3?

**Fill in:**

✓ 7

**Hints:**

- 21 divided by 3 is 7.

Type in 7.

---

**4) Assisment #237159 '237159 - This is your last...'**

This is your last problem. Remember if you have any problems with a question, please e-mail [accuhelp@gmail.com](mailto:accuhelp@gmail.com). Good luck!

What is  $143 + 29$ ?

**Fill in:**

✓ 172

**Hints:**

- The answer is 172.

Type in 172.

---



## Pre-Test

### Problem Set "Problem Set "Arithmetic Accuplacer ASSISTments Evaluation - A" " id: [37682]

#### 1) Assistent #222513 '222513 - #1 ''

Round 793,749,417 to the nearest hundred thousand.

**Multiple choice:**

- ☒ A. 793,700,000
- ☐ B. 700,000,000
- ☐ C. 793,800,000
- ☐ D. 800,000,000

**Hints:**

- The answer is A. 793,700,000.
- 

#### 2) Assistent #222515 '222515 - #2 ''

Which is smaller:

$$\frac{2}{3} \text{ or } \frac{3}{4}$$

**Multiple choice:**

- ☒ A. 2/3
- ☐ B. 3/4
- ☐ C. They are the same size

**Hints:**

- The answer is A. 2/3.
- 

#### 3) Assistent #222517 '222517 - #3 ''

Compute:

$$\frac{31,289}{67}$$

**Multiple choice:**

- ☐ A. 477 R. 58
- ☒ B. 467
- ☐ C. 457
- ☐ D. 472 R. 50

**Hints:**

- The answer is B. 467
-

4) Assisment #222519 '222519 - #4''

Write  $\frac{375}{1000}$  in simplest form.

Multiple choice:

- ☐ A.  $\frac{3}{7}$
- ☒ B.  $\frac{3}{8}$
- ☐ C.  $\frac{15}{40}$
- ☐ D.  $\frac{3}{16}$

Hints:

- The answer is B.  $\frac{3}{8}$ .
- 

5) Assisment #222521 '222521 - #5''

Find the square root:  $\sqrt{289}$

Multiple choice:

- ☐ A. 289
- ☒ B. 17
- ☐ C. 144.5
- ☐ D. 34

Hints:

- The answer is B. 17.
- 

6) Assisment #222703 '222703 - #11''

Solve and Check:

$$\frac{9}{\frac{1}{z}} - \frac{8}{x}$$

Multiple choice:

- ☒ A.  $\frac{2}{9}$
- ☐ B.  $\frac{4}{9}$
- ☐ C.  $\frac{4}{17}$
- ☐ D.  $\frac{1}{2}$

Hints:

- The answer is A.  $\frac{2}{9}$ .
- 

7) Assisment #222694 '222694 - #2''

The Students in Hugh Logan's math class took the Scholastic Aptitude Test. Their math scores are shown below.

631 623 359 340 648  
354 342 526 470 432

**Multiple choice:**

Find the mean score. Round to the nearest tenth if necessary.

- ☒ A. 476.0
- ☒ B. 458.1
- ☒ C. 476.8
- ☒ D. 477.5

**Hints:**

- The answer is D. 477.5.

---

**8) Assisment #222527 "222527 - #8"**

To make car payments, a teenager borrows \$1000 from a relative for 5 years at 4% anual simple interest. Find the amount of simple interest that is due after 5 years.

**Multiple choice:**

- ☒ A. \$20.00
- ☒ B. \$200.00
- ☒ C. \$800.00
- ☒ D. \$50.00

**Hints:**

- The answer is B. \$200.00.

---

**9) Assisment #222529 "222529 - #9"**

An art school began ten straight years of material fee increases by raising its material fee from \$200 to \$293. Find the percent increase.

**Multiple choice:**

- ☒ A. 46.5% increase
- ☒ B. 47.5% increase
- ☒ C. 48% increase
- ☒ D. 45.5% decrease

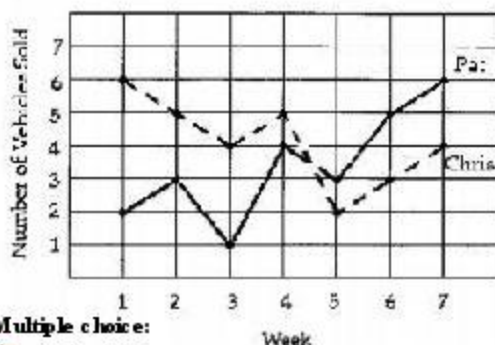
**Hints:**

- The answer is A. 46.5% increase.

---

**10) Assisment #222531 "222531 - #10"**

The following graph indicates the number of vehicles sold during a seven week period by two different sales people.



Multiple choice:

- How many more vehicles did Chris sell in the first week than Chris sold in the third week?
- ☒ A. 3 vehicles
  - ☒ B. 5 vehicles
  - ☒ C. 4 vehicles
  - ☒ D. 2 vehicles

Hints:

- The answer is D. 2 vehicle.

11) Assignment #222533 "222533 - #11"

In one year, a baseball player got 147 hits in 458 times at bat. What was his batting average to the nearest thousandth?

Multiple choice:

- ☒ A. 0.331
- ☒ B. 0.321
- ☒ C. 0.301
- ☒ D. 0.324

Hints:

- The answer is B. 0.321.

12) Assignment #222535 "222535 - #12"

Write your answer as an **Improper Fraction**:

The dimensions of a rectangular mural on the wall of Amy's bedroom are

$$2\frac{1}{3} \text{ by } 3\frac{3}{4}$$

What is the area of the mural?

Multiple choice:

- ☒ A.  $35/4$  sq ft
- ☒ B.  $29/4$  sq ft
- ☒ C.  $31/4$  sq ft
- ☒ D.  $83/4$  sq ft

**Hints:**

- The answer is A.  $35/4$  sq ft.

---

**13) Assisment #222537 "222537 - #13"**

A car traveled 254.2 miles on 12.4 gallons of gas. How many miles per gallon did it get?

**Round to the nearest tenth.**

**Multiple choice:**

- ☐ A. 20.9 mpg
- ☒ B. 20.5 mpg
- ☐ C. 22 mpg
- ☐ D. 21.5 mpg

**Hints:**

- The answer is B. 20.5 mpg.

---

**14) Assisment #222539 "222539 - #14"**

Compute:

$$\left(19 + \frac{1}{5}\right) - 6\left(2 + \frac{1}{5}\right)$$

**Multiple choice:**

- ☐ A. 18 and  $1/5$
- ☐ B. 7 and  $1/5$
- ☒ C. 6 and  $1/5$
- ☐ D. 7

**Hints:**

- The answer is C. 6 and  $1/5$ .

## Post Test

### Problem Set "Arithmetic Accuplacer ASSISTments Evaluation - B" id:[37700]

#### 1) Assistentment #222702 '222702 - #1'

Round 593,749,525 to the nearest hundred thousand.

Multiple choice:

- ☐ A. 500,000,000
- ☒ B. 593,700,000
- ☐ C. 600,000,000
- ☐ D. 593,800,000

Hints:

- The answer is B. 593,700,000.

---

#### 2) Assistentment #222699 '222699 - #2'

Which is smaller:

$$\frac{2}{3} \text{ or } \frac{7}{8}$$

Multiple choice:

- ☐ A. 7/8
- ☒ B. 2/3
- ☐ C. They are the same size

Hints:

- The answer is B. 2/3.

---

#### 3) Assistentment #222701 '222701 - #3'

Compute:

$$\frac{42,120}{45}$$

Multiple choice:

- ☐ A. 941 R. 30
- ☒ B. 936
- ☐ C. 946 R. 38
- ☐ D. 926

Hints:

- The answer is B. 936.
-

4) Assignment #222700 '222700 - #4'

Write  $\frac{625}{1000}$  in simplest form.

Multiple choice:

- ☐ A. 25/40
- ☒ B. 5/8
- ☐ C. 5/7
- ☐ D. 5/16

Hints:

- The answer is B. 5/8.

---

5) Assignment #222706 '222706 - #5'

Find the square root:  $\sqrt{121}$

Multiple choice:

- ☐ A. 22
- ☒ B. 11
- ☐ C. 121
- ☐ D. 60.5

Hints:

- The answer is B. 11.

---

6) Assignment #222523 '222523 - #6'

Solve and Check:

$$\frac{7}{\frac{1}{6}} = \frac{24}{x}$$

Multiple choice:

- ☐ A. 6/31
- ☐ B. 6/7
- ☒ C. 4/7
- ☐ D. 2/3

Hints:

- The answer is C. 4/7.

---

7) Assignment #222525 '222525 - #7'

The Students in Hugh Logan's math class took the Scholastic Aptitude Test. Their math scores are shown below.

631	623	359	340	648
354	342	526	470	432

Find the mean score. Round to the nearest tenth if necessary.

**Multiple choice:**

- ☐ A. 487.2
- ☐ B. 468.1
- ☒ C. 477.5
- ☐ D. 476.0

**Hints:**

- The answer is C. 477.5.

---

8) Assisment #222695 "222695 - #3"

To make car payments, a teenager borrows \$200 from a relative for 5 years at 4% simple interest. Find the amount of simple interest that is due.

**Multiple choice:**

- ☐ A. \$126.00
- ☐ B. \$257.14
- ☒ C. \$40.00
- ☐ D. \$3.17

**Hints:**

- The answer is C. \$40.00.

---

9) Assisment #222697 "222697 - #9"

An art school began ten straight years of material fee increases by raising its material fee from \$200 to \$287. Find the percent increase.

**Multiple choice:**

- ☐ A. 42.5% decrease
- ☐ B. 44.5% increase
- ☐ C. 45% increase
- ☒ D. 43.5% increase

**Hints:**

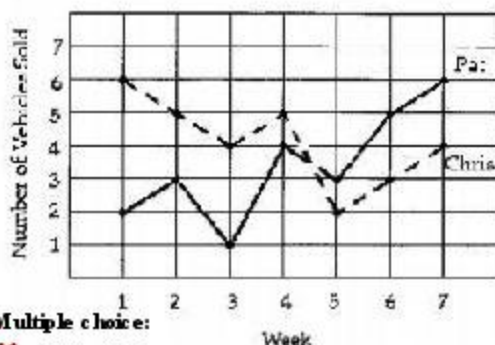
- The answer is D. 43.5% increase.

---

10) Assisment #222696 "222696 - #10"

The following graph indicates the number of vehicles sold during a seven week period by two different sales people.





Multiple choice:

- How many more vehicles did Chris sell in the first week than Chris sold in the seventh week?
- ☒ A. 3 vehicles
  - ☒ B. 2 vehicles
  - ☐ C. 4 vehicles
  - ☐ D. 5 vehicles

Hints:

- The answer is B. 2 vehicles.

11) Assignment #222691 "222691 - #11"

In one year, a baseball player got 194 hits in 493 times at bat. What was the batting average to the nearest thousandth?

Multiple choice:

- ☐ A. 0.397
- ☐ B. 0.374
- ☒ C. 0.394
- ☐ D. 0.404

Hints:

- The answer is C. 0.394.

12) Assignment #222704 "222704 - #12"

Write your answer as a **Mixed Fraction**:

The dimensions of a rectangular mural on the wall of Amy's bedroom are

$$2\frac{1}{4} \text{ ft by } 3\frac{1}{5} \text{ ft}$$

What is the area of the mural?

Multiple choice:

- ☐ A. 6 and  $\frac{4}{5}$  sq ft
- ☐ B. 6 and  $\frac{1}{20}$  sq ft

- ☒ C. 6 and 9/20 sq ft  
☒ D. 7 and 1/5 sq ft

**Hints:**

- The answer is D. 7 and 1/5 sq ft.

---

**13) Assignment #222705 "222705 - #13"**

A car traveled 230.4 miles on 9.6 gallons of gas. How many miles per gallon did it get?

**Multiple choice:**

- ☒ A. 24 mpg  
☒ B. 25.4 mpg  
☒ C. 25.6 mpg  
☒ D. 25.21 mpg

**Hints:**

- The answer is A. 24 mpg.

---

**14) Assignment #222698 "222698 - #14"**

Compute:

$$\left(16 + \frac{1}{6}\right) - 5\left(2 + \frac{1}{5}\right)$$

**Multiple choice:**

- ☒ A.  $5 + \frac{1}{6}$   
☒ B. 6  
☒ C.  $15 + \frac{1}{6}$   
☒ D.  $6 + \frac{1}{6}$

**Hints:**

- The answer is A.  $5 + \frac{1}{6}$ .

# Arithmetic Problem Sets

## Equivalent Fractions

### Problem Set "Equivalent Fractions" id:[41451]

#### 1) Assisment #226080 '226080 - 160773 - Convert mixed number to improper number - Level 1'

Convert the following to an improper fraction:

$$2 \frac{1}{5}$$

Fill in:

✓ 11/5

Hints:

- To represent the mixed number as an improper fraction, first you need to convert 2 to a fraction with a denominator of 5.

$$2 = \frac{2 \times 5}{5} = \frac{10}{5}$$

- Now you can just add the two fractions.

$$\frac{10}{5} + \frac{1}{5} = ?$$

•

$$2 \frac{1}{5} = \frac{11}{5}$$

---

#### 2) Assisment #226125 '226125 - Improper Fraction to Mixed Number'

Convert the improper fraction below to a mixed number.

$$\frac{133}{7}$$

Fill in:

✓ 19

Hints:

- First divide,  $133 \div 7$ .

This table of the multiples of 7 may help.

Multiples of 7	
7*1	7
7*2	14
7*3	21

7*4	28
7*5	35
7*6	42
7*7	49
7*8	56
7*9	63
7*10	70
7*11	77
7*12	84
7*13	91
7*14	98
7*15	105
7*16	112
7*17	119
7*18	126
7*19	133
7*20	140
7*21	147
7*22	154
7*23	161
7*24	168
7*25	175
7*26	182
7*27	189
7*28	196
7*29	203
7*30	210

- As can be inferred from the table, the answer for  $133/7$  is 19. Type in 19.

**3) Assignment #226140 - 161219 - 160773 - Convert mixed number to improper number - Level 2 "**

Convert the following to an improper fraction:

$$14 \frac{16}{19}$$

**Fill in:**

✓ 282/19

**Hints:**

- To represent the mixed number as an improper fraction, first you need to convert 14 to a fraction with a denominator of 19.

$$14 = \frac{14 \times 19}{19} = \frac{266}{19}$$

- Now you can just add the two fractions.

$$\frac{266}{19} + \frac{16}{19} = ?$$

•

$$14 \frac{16}{19} = \frac{282}{19}$$

---

**4) Assignment #226155 "226155 - Reducing Fractions to Lowest Terms (Level 2)"**

Simplify the following fraction into its lowest terms.

Remember to write your answer as a mixed number with a space between the integer and the fraction.

$$10 \frac{15}{45}$$

**Fill in:**

✓ 10 1/3

**Hints:**

- Find the largest common factor of the given numerator, 15, and denominator, 45.
- The largest common factor between 15 and 45 is 15. Divide 15 and 45 by 15 to calculate the fraction in its lowest terms.
- Type 10 1/3.

---

**5) Assignment #226170 "226170 - Reducing fractions to lowest terms - Level 1"**

Reduce the following fraction to its lowest terms:

$$\frac{65}{78}$$

**Fill in:**

✓ 5/6

**Hints:**

- In order to reduce a fraction, you must find a factor shared by both the numerator and denominator, and divide them by that factor.

To reduce a fraction to its lowest terms, you must do this until the numerator and denominator don't share any factors.

- When reduced to its lowest terms,  $65/78$  becomes  $5/6$ .

Type in  $5/6$

---

## Adding and Subtracting Proper Fractions

### Problem Set "Adding and Subtracting Proper Fractions" [41455]

#### 1) Assignment #235618 "235618 - Subtracting Proper Fractions"

Find the difference:

$$\frac{9}{10} - \frac{1}{6}$$

Answers must be in the form of a *reduced proper fraction* (example  $\frac{2}{7}$ ) or a *mixed number* with a space between the whole number and the fraction (example  $3 \frac{5}{8}$ )

Fill in:

✓ 11/15

Hints:

- The least common denominator is **30** because it is the smallest number into which both **10** and **6** divide evenly.

$$\frac{9}{10} - \frac{1}{6}$$

Find equivalent fractions using the denominator **30**.

- To find equivalent fractions with the denominator **30**, multiply  $\frac{9}{10}$  by  $\frac{3}{3}$  and  $\frac{1}{6}$  by  $\frac{5}{5}$ :

$$\begin{aligned} \frac{9 \cdot 3}{10 \cdot 3} - \frac{1 \cdot 5}{6 \cdot 5} &= \frac{27}{30} - \frac{5}{30} \\ &= \frac{27 - 5}{30} \end{aligned}$$

Now, find the difference in the numerator.

- Finding the difference in the numerator gives:

$$\begin{aligned} \frac{27 - 5}{30} &= \frac{22}{30} \\ &= \frac{22}{30} \\ &= \frac{11}{15} \end{aligned}$$

Enter 11/15

---

2) Assignment #235648 - Adding Proper Fractions"

Find the sum:

$$\frac{7}{11} + \frac{6}{11}$$

Answers must be in the form of a *reduced proper fraction* (example 2/7) or a *mixed number* with a space between the whole number and the fraction (example 3 5/8)

Fill in:

✓ 1 2/11

Hints:

- The denominators 11 and 11 are *like denominators*.

$$\frac{7}{11} + \frac{6}{11}$$

Because the denominators are like denominators, use the denominator 11. Add the numerators.

- Add the fractions:

$$\frac{7}{11} + \frac{6}{11} = \frac{7+6}{11}$$

Now, sum the numerator.

- Summing the numerator gives:

$$\begin{aligned} \frac{7+6}{11} &= \frac{13}{11} \\ &= 12/11 \end{aligned}$$

Enter 1 2/11

---



## Adding and Subtracting Mixed Numbers

### Problem Set "Adding and Subtracting Mixed Numbers" 41457

#### 1) Assignment #236045 "236045 - Subtracting Mixed Numbers"

Find the difference:

$$5\frac{1}{9} - 1\frac{5}{18}$$

Answers must be in the form of a *reduced proper fraction* (example  $\frac{2}{7}$ ) or a *mixed number* with a space between the whole number and the fraction (example  $3\frac{5}{8}$ )

Fill in:

✓  $3\frac{5}{6}$

Hints:

- Notice  $9$  is a factor of  $18$ .

$$5\frac{1}{9} - 1\frac{5}{18}$$

Because  $9$  is a factor of  $18$  the least common denominator is  $18$ .

- Convert the *first* fraction to an equivalent fraction with a denominator of  $18$ : multiply its numerator and denominator by  $18/9=2$  (note:  $9*2=18$ ):

$$5\frac{1*2}{9*2} - 1\frac{5}{18} = 5\frac{2}{18} - 1\frac{5}{18}$$

Since the second numerator is greater than the first, we have to borrow. Borrow 1 from the first whole number, 5, and represent it in fractional form using the common denominator:  $5 = 4 + 1 = 4 + \frac{18}{18}$

$$4\frac{18+2}{18} - 1\frac{5}{18}$$

Next, group the whole number terms and put both fractions together over the common denominator:

$$20 - 5 \quad \frac{20 - 5}{18}$$

$$4\frac{\textcolor{violet}{20}}{\textcolor{violet}{18}} - 1\frac{\textcolor{violet}{5}}{\textcolor{violet}{18}} = (4-1)\frac{\textcolor{violet}{15}}{\textcolor{violet}{18}}$$

Now, find the difference in the numerator and in the whole numbers.

- Subtracting gives:

$$\begin{array}{r} 20 - 5 \\ (4 - 1) \frac{\textcolor{violet}{18}}{\textcolor{violet}{18}} = 3 \frac{\textcolor{violet}{15}}{\textcolor{violet}{18}} \\ = 3 \frac{5}{6} \end{array}$$

Enter **3 5/6**

## 2) Assignment #236092 "236092 - Adding Mixed Numbers"

Find the sum:

$$7\frac{1}{2} + 1\frac{7}{8}$$

Answers must be in the form of a reduced proper fraction (example 2/7) or a mixed number with a space between the whole number and the fraction (example 3 5/8)

Fill in:

✓ 9 3/8

Hints:

- Notice **2** is a factor of **8**.

$$7\frac{1}{\textcolor{red}{2}} + 1\frac{7}{\textcolor{blue}{8}}$$

Because **2** is a factor of **8**, the least common denominator is **8**.

- Convert the *first* fraction to an equivalent fraction with a denominator of **8**: multiply its numerator and denominator by **8/2=4** (note:  $2 \cdot 4 = 8$ ):

$$7\frac{\textcolor{brown}{1} \cdot \textcolor{brown}{4}}{\textcolor{brown}{2} \cdot \textcolor{brown}{4}} + 1\frac{7}{\textcolor{blue}{8}} = 7\frac{\textcolor{brown}{4}}{\textcolor{brown}{8}} + 1\frac{7}{\textcolor{violet}{8}}$$

Then, group the whole number terms and put both fractions together over the common denominator:

$$7\frac{4}{8} + 1\frac{7}{8} = (7+1)\frac{4+7}{8}$$

Now, sum the numerator and the whole numbers.

- Summing the numerator and the whole numbers gives:

$$\begin{aligned} (7+1)\frac{4+7}{8} &= 8\frac{11}{8} \\ &= 8+1\frac{3}{8} \\ &= 9\frac{3}{8} \end{aligned}$$

Enter **9 3/8**

---

## Multiplying and Dividing Proper Fractions

### Problem Set "Multiplying and Dividing Proper Fractions" id:[41458]

#### 1) Assignment #229557 '229557 - Dividing Fractions(OC)'

Calculate the quotient of the following two fractions and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 1 1/3.

$$\frac{4}{5} \div \frac{8}{3}$$

Fill in:

✓ 3/10

Hints:

- When dividing fractions, you need to first flip the second fraction and create a multiplication problem, as shown below:

$$\frac{4}{5} \div \frac{8}{3} = \frac{4}{5} * \frac{3}{8}$$

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.
- Reduction of Fractions:

$$\frac{4}{5} * \frac{3}{8} = \frac{\cancel{4}^1}{5} * \frac{3}{\cancel{8}_2} = ?$$

- Multiply the two fractions by multiplying across. Multiply the numerators and multiply the denominators.

Answer should be written in fraction form.

$$\frac{4}{5} * \frac{3}{8} = \frac{1}{5} * \frac{3}{2} = \frac{3}{10}$$

Type the answer 3/10.

#### 2) Assignment #229597 '229597 - Multiplying Fractions(TC)'

Calculate the product of the following two fractions and make sure your answer is in **SIMPLEST FORM!**

$$\frac{11}{13} \times \frac{39}{44}$$

Fill in:

✓ 3/4

**Hints:**

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.

- Reduction of Fractions:

$$\frac{11}{13} \cdot \frac{39}{44} = \frac{\cancel{11} \cdot 1}{\cancel{13} \cdot 4} = ?$$

- Remember when multiplying fractions, you need to multiply across. Multiply one numerator by the other and then multiply one denominator by the other.

- Answer should be written in fraction form.

$$\frac{11}{13} \cdot \frac{39}{44} = \frac{1}{4} \cdot \frac{3}{4} = \frac{3}{16}$$

Type the answer 3/4.

**3) Assignment #229617 "229617 - Dividing Fractions(TC)"**

Calculate the quotient of the following two fractions and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 6 3/7.

$$\frac{17}{36} \div \frac{17}{16}$$

Fill in:

✓ 4/9

**Hints:**

- When dividing fractions, you need to first flip the second fraction and create a multiplication problem, as shown below:

$$\frac{17}{36} \div \frac{17}{16} = \frac{17}{36} \cdot \frac{16}{17}$$

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.

- Reduction of Fractions:

$$\frac{17}{36} \cdot \frac{16}{17} = \frac{\cancel{17} \cdot 1}{\cancel{17} \cdot 9} = \frac{16}{9}$$

- Remember when multiplying fractions, you need to multiply across. Multiply one numerator by the other and then multiply one denominator by the other.

Answer should be written in fraction form.

$$\frac{17}{36} * \frac{16}{17} = \frac{1}{9} * \frac{4}{9} = \frac{4}{9}$$

Type the answer 4/9.

---

4) Assisment #229657 '229657 - Multiplying Fraction(NC)'

Calculate the product of the following two fractions and make sure your answer is in **SIMPLEST FORM!**

$$\frac{3}{8} \times \frac{3}{8}$$

Fill in:

✓ 9/64

Hints:

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.
- Since there are no common factors, no reduction is necessary. Multiply the two fractions by multiplying across. Multiply the numerators and multiply the denominators.
- Answer should be written in fraction form. Type the answer 9/64.

---

5) Assisment #229677 '229677 - 221889 - Dividing Fraction(NC)'

Calculate the quotient of the following two fractions and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 3 1/3.

$$\frac{3}{8} \div \frac{13}{5}$$

Fill in:

✓ 15/104

Hints:

- When dividing fractions, you need to first flip the second fraction and create a multiplication problem, as shown below:

$$\frac{3}{8} \div \frac{13}{5} = \frac{3}{8} * \frac{5}{13}$$

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.
- Since there are no common factors, no reduction is necessary. Multiply the two fractions by

- Remember to cancel any common factors, and to simplify the answer. Always multiply the top of fractions by multiplying across. Multiply the numerators and then multiply the denominators.
- Answer should be written in fraction form. Type the answer 15/104.

**6) Assignment #229754 "229754 - Multiplying Fractions(TC)"**

Calculate the product of the following two fractions and make sure your answer is in **SIMPLEST FORM!**

$$\frac{7}{9} \times \frac{6}{7}$$

**Fill in:**

✓ 2/3

**Hints:**

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.
- Reduction of Fractions:

$$\frac{7}{9} \times \frac{6}{7} = \frac{\cancel{7}^1}{9 \cdot 3} \times \frac{\cancel{6}_2}{\cancel{7}_1} = ?$$

- Remember when multiplying fractions, you need to multiply across. Multiply one numerator by the other and then multiply one denominator by the other.
- Answer should be written in fraction form.

$$\frac{7}{9} \times \frac{6}{7} = \frac{1 \cdot 2}{3 \cdot 1} = \frac{2}{3}$$

Type the answer 2/3.

## Multiplying and Dividing Mixed Numbers

### Problem Set "Multiplying and Dividing Mixed Numbers" id: 41459

#### 1) Assignment #229850 "229850 - Dividing Fractions(M/M)"

Calculate the quotient of the following and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 6 3/4.

$$5\frac{7}{8} \div \frac{9}{41}$$

Fill in:

✓ 26 55/72

#### Hints:

- When dividing fractions, you need to first flip the second fraction and create a multiplication problem, as shown below:

$$5\frac{7}{8} \div \frac{9}{41} = 5\frac{7}{8} * \frac{41}{9}$$

- Remember when multiplying fractions with mixed numbers you need to convert the mixed numbers to improper fractions.

$$5\frac{7}{8} * \frac{41}{9} = \frac{47}{8} * \frac{41}{9}$$

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.
- Since there are no common factors, multiply the two fractions by multiplying across. Multiply the numerators and then multiply the denominators.
- Answer should be written in mixed number form.

$$5\frac{7}{8} * \frac{41}{9} = \frac{47}{8} * \frac{41}{9} = \frac{1927}{72}$$

The Mixed Number Representation is seen here:

$$26\frac{55}{72}$$

Type the answer 26 55/72.

---

#### 2) Assignment #229887 "229887 - 217963 - Multiplying Fraction(MP)"



Calculate the product of the following and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 2 2/9.

$$3\frac{1}{6} \times \frac{2}{5}$$

Fill in:

✓ 1 4/15

Hints:

- Remember when multiplying fractions with mixed numbers you need to convert the mixed numbers to improper fractions.

$$3\frac{1}{6} \times \frac{2}{5} = \frac{19}{6} \times \frac{2}{5}$$

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.

- Reduction of Fractions:

$$\frac{19}{6} \times \frac{2}{5} = \frac{19}{\cancel{6}^3} \times \frac{\cancel{2}^1}{5} = ?$$

- Multiply the two fractions by multiplying across. Multiply the numerators and then multiply the denominators.

- Answer should be written in fraction form.

$$\frac{19}{6} \times \frac{2}{5} = \frac{19}{3} \times \frac{1}{5} = \frac{19}{15}$$

The Correct Answer Representation is seen here:

$$1\frac{4}{15}$$

Type the answer 1 4/15.

### 3) Assignment #229917 "229917 - Dividing Fractions(M/W)"

Calculate the quotient of the following and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 4 3/7.

$$3\frac{4}{9} \div \frac{1}{5}$$

Fill in:

✓ 17 2/9

Hints:

- When dividing fractions, you need to first flip the second fraction and create a multiplication problem, as shown below:

$$3\frac{4}{9} \div \frac{1}{5} = 3\frac{4}{9} * \frac{5}{1}$$

- Remember when multiplying fractions with mixed numbers you need to convert the mixed numbers to improper fractions:

$$3\frac{4}{9} * \frac{5}{1} = \frac{31}{9} * \frac{5}{1}$$

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.

•

Multiply the two fractions by multiplying across. Multiply the numerators and multiply the denominators.

Answer should be written in fraction form.

$$3\frac{4}{9} * \frac{5}{1} = \frac{31}{9} * \frac{5}{1} = \frac{155}{9}$$

The Mixed Number Representation is seen here:

$$17\frac{2}{9}$$

Type the answer 17 2/9.

#### 4) Assignment #229932 '229932 - 222198 - Dividing Fractions(MP)'

Calculate the quotient of the following and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 2 4/5.

$$4\frac{1}{8} \div \frac{5}{8}$$

$$21 \quad 7$$

Fill in:

✓ 3 13/24

Hints:

- When dividing fractions, you need to first flip the second fraction and create a multiplication problem, as shown below:

$$4 \frac{1}{21} \div \frac{8}{7} = 4 \frac{1}{21} * \frac{7}{8}$$

- Remember when multiplying fractions with mixed numbers you need to convert the mixed numbers to improper fractions.

$$4 \frac{1}{21} * \frac{7}{8} = \frac{85}{21} * \frac{7}{8}$$

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.

- Reduction of Fractions:

$$\frac{85}{21} * \frac{7}{8} = \frac{85}{\cancel{21}^3} * \frac{\cancel{7}^1}{8} = ?$$

- Multiply the two fractions by multiplying across. Multiply the numerators and then multiply the denominators.

Answer should be written in fraction form.

$$\frac{85}{21} * \frac{7}{8} = \frac{85}{3} * \frac{1}{8} = \frac{85}{24}$$

The Correct Answer Representation is seen here:

$$3 \frac{13}{24}$$

Type the answer 3 13/24.

#### 5) Assignment #229944 "229944 - Dividing Fractions(MP)"

Calculate the quotient of the following and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 5 1/4.

$$2 \frac{3}{22} \div \frac{5}{11}$$

Fill in:

✓ 4 7/10

Hints:

- When dividing fractions, you need to first flip the second fraction and create a multiplication problem, as shown below:

$$2 \frac{3}{22} \div \frac{5}{11} = 2 \frac{3}{22} * \frac{11}{5}$$

- Remember when multiplying fractions with mixed numbers you need to convert the mixed numbers to improper fractions.

$$2 \frac{3}{22} * \frac{11}{5} = \frac{47}{22} * \frac{11}{5}$$

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.

- Reduction of Fractions:

$$\frac{47}{22} * \frac{11}{5} = \frac{47}{\cancel{22}^2} * \frac{\cancel{11}^1}{5} = ?$$

- Multiply the two fractions by multiplying across. Multiply the numerators and then multiply the denominators.

Answer should be written in fraction form.

$$\frac{47}{22} * \frac{11}{5} = \frac{47}{2} * \frac{1}{5} = \frac{47}{10}$$

The Mixed Number Representation is seen here:

$$4 \frac{7}{10}$$

Type the answer 4 7/10.

---

6) Assignment #229952 - 229952 - 220065 - Multiplying Fraction(M/M)'

Calculate the product of the following and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 4 1/2.

$$4 \frac{3}{5} \times 3 \frac{3}{8}$$

Fill in:

✓ 15 21/40

Hints:

- Remember when multiplying fractions with mixed numbers you need to convert the mixed numbers to improper fractions.

$$4 \frac{3}{5} * 3 \frac{3}{8} = \frac{23}{5} * \frac{27}{8}$$

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.
- Since there are no common factors, multiply the two fractions by multiplying across. Multiply the numerators and then multiply the denominators.
- Answer should be written in mixed number form.

$$4 \frac{3}{5} * 3 \frac{3}{8} = \frac{23}{5} * \frac{27}{8} = \frac{621}{40}$$

The Mixed Number Representation is seen here:

$$15 \frac{21}{40}$$

Type the answer 15 21/40.

---

7) Assignment #256379 "256379 - Dividing Fractions(M/W)"

Calculate the quotient of the following and make sure your answer is in **SIMPLEST FORM!**

If your answer is an improper fraction, submit your answer as a mixed number with a space between the whole number and the fraction parts. Example: 1 4/5.

$$2 \frac{5}{11} \div 5$$

Fill in:

✓ 27/55

Hints:

- When dividing fractions, you need to first flip the second fraction and create a multiplication problem, as shown below:

$$2 \frac{5}{11} \div 5 = 2 \frac{5}{11} * \frac{1}{5}$$

- Remember when multiplying fractions with mixed numbers you need to convert the mixed numbers

to improper fractions.

$$2 \frac{5}{11} * \frac{1}{5} = \frac{27}{11} * \frac{1}{5}$$

- Determine if either numerator has a common factor with either denominator, if so, cancel the common factor.
- Multiply the two fractions by multiplying across. Multiply the numerators and multiply the denominators.

Answer should be written in fraction form.

$$2 \frac{5}{11} * \frac{1}{5} = \frac{27}{11} * \frac{1}{5} = \frac{27}{55}$$

The Correct Answer Representation is seen here:

27

55

Type the answer 27/55.

## Addition and Subtraction Positive Decimals

### Problem Set "Addition and Subtraction Positive Decimals" id:[41461]

#### 1) Assisment #234581 '234581 - 19 49 69 - Milca - Addition of decimals - Range .001 and 100'

What is  $12.2 + 10.307$ ?

Fill in:

✓ 22.507

Hints:

- When adding you need to add the ones with the ones. The tenths with the tenths. AND SO ON.

You must line up the decimal to do this.

- In this case we add 0 hundredths and 0 thousandths to 12.2. This does not change the value of the number.

Line up the decimal like this and add, keeping the decimal in place.

$$\begin{array}{r} 12.200 \\ + 10.307 \\ \hline \end{array}$$

- When you add you get:

$$\begin{array}{r} 12.200 \\ + 10.307 \\ \hline 22.507 \end{array}$$

Type in 22.507.

---

#### 2) Assisment #234591 '234591 - 20 85 98 - Subtraction of Decimals - G'

What is  $56.04 - 55.8$ ?

Fill in:

✓ 0.24

✓ .24

Hints:

- When subtracting decimals you need to subtract the ones from the ones. The tenths from the tenths. AND SO ON.

You must line up the decimal to do this.

- In this case, add 0 hundredths to 55.8. This does not change the value of the number.  
Line up the numbers like this and subtract. Make sure the decimal is in the same place in the answer!

$$\begin{array}{r} 56.04 \\ - 55.80 \\ \hline \end{array}$$

- When you subtract you get:

$$\begin{array}{r} 56.04 \\ - 55.80 \\ \hline 0.24 \end{array}$$

Type in 0.24.

### 3) Assignment #234601 '234601 - 194991 - Subtraction of Decimals - A'

What is  $96 - 0.071$ ?

Fill in:

✓ 95.929

#### Hints:

- Before subtracting, write the decimal numbers one right under the other, lining up the decimal points.
- When you align your decimals, you should end with something that looks like this:

$$\begin{array}{r} 96.000 \\ - 0.071 \\ \hline \end{array}$$

Perform the subtraction and enter your answer.

- After we perform the subtraction, you should get something like this:

$$\begin{array}{r} 96.000 \\ - 0.071 \\ \hline \end{array}$$



95.929

The answer is 95.929, type in 95.929 and submit.

---

4) Assignment #234611 "234611 - 208599 - Subtraction of Decimals - H"

What is  $62 - 41.33$ ?

Fill in:

✓ 20.67

✓ 20.67

Hints:

- When subtracting decimals you need to subtract the **ones from the ones**. The **tenths from the tenths**. AND SO ON.

You must line up the decimal to do this.

- In this case, add 0 tenths and 0 hundredths to 62. This does not change the value of the number. Line up the decimals like this and subtract. Make sure the decimal is in the same place in the answer!

62.00

- 41.33

- When you subtract you get:

62.00

- 41.33

20.67

Type in 20.67.

---

5) Assignment #234621 "234621 - Addition of decimals - Ones place + Tenths place"

What is  $5 + 3.6$ ?

Fill in:

✓ 8.6

Hints:

- When adding you need to **add the ones with the ones**. The **tenths with the tenths**. AND SO ON.

You must line up the decimal to do this.

- In this case we add 0 tenths to 5. This does not change the value of the number.

When adding you need to add the ones with the ones. The tenths with the tenths. AND SO ON.  
 You must line up the decimal to do this.

Line up the decimal like this and add, keeping the decimal in place.

$$\begin{array}{r} 5.0 \\ + 3.6 \\ \hline \end{array}$$

- When you add you get:

$$\begin{array}{r} 5.0 \\ + 3.6 \\ \hline 8.6 \end{array}$$

Type in 8.6.

6) Assisment #234631 '234631 - 194969 - Milca - Addition of decimals - Range .001 and 100'

What is  $49.671 + 82.225$ ?

Fill in:

✓ 131.896

Hints:

- When adding you need to add the ones with the ones. The tenths with the tenths. AND SO ON.

You must line up the decimal to do this.

- In this case we line up the decimal like this and add, keeping the decimal in place.

$$\begin{array}{r} 49.671 \\ + 82.225 \\ \hline \end{array}$$

- When you add you get:

$$\begin{array}{r} 49.671 \\ + 82.225 \\ \hline 131.896 \end{array}$$

Type in 131.896.

7) Assisment #234641 '234641 - 208600 - Subtraction of Decimals - I'

What is  $546.600 - 385.815$ ?

What is  $546.602 - 385.815$ ?

Fill in:

✓ 160.787

✓ 160.787

Hints:

- When subtracting decimals you need to subtract the **ones from the ones**. The **tenths from the tenths**. AND SO ON.

You must line up the decimal to do this.

- Line up the decimals like this and subtract. Make sure the decimal is in the same place in the answer!

546.602

- 385.815

- When you subtract you get:

546.602

- 385.815

160.787

Type in 160.787.

---

8) Assignment #234651 "234651 - Subtraction of Decimals - B"

What is  $1.71 - 0.011$ ?

Fill in:

✓ 1.699

Hints:

- Before subtracting, write the decimal numbers one right under the other, lining up the decimal points.
- When you align your decimals, you should end with something that looks like this:

1.710

0.011

- \_\_\_\_\_

Perform the subtraction and enter your answer.

- After we perform the subtraction, you should get something like this:

$$\begin{array}{r} 1.710 \\ - 0.011 \\ \hline 1.699 \end{array}$$

The answer is 1.699, type in 1.699 and submit.

9) Assignment #234661 "234661 - 208601 - Subtraction of Decimals - J"

What is  $55.01 - 54.443$ ?

Fill in:

- ✓ 0.567
- ✓ .567

Hints:

- When subtracting decimals you need to subtract the **ones from the ones**. The **tenths from the tenths**. AND SO ON.

You must line up the decimal to do this.

- In this case, add 0 thousandths to 55.01. This does not change the value of the number. Line up the decimals like this and subtract. Make sure the decimal is in the same place in the answer!

$$\begin{array}{r} 55.010 \\ - 54.443 \\ \hline \end{array}$$

- When you subtract you get:

$$\begin{array}{r} 55.010 \\ - 54.443 \\ \hline 0.567 \end{array}$$

Type in 0.567.

10) Assignment #234671 "234671 - 105270 - Mike - Addition of Decimals - Renee"

What is  $24621 + 0.474862$ ?

Fill in:

✓ 24621.474862

Hints:

- When adding you need to add the ones with the ones. The tenths with the tenths. AND SO ON.

You must line up the decimal to do this:

- In this case we add 0 tenths, 0 hundredths, 0 thousandths, 0 ten-thousandths, 0 hundred-thousandths and 0 millionths to 24621. This does not change the value of the number.

Line up the decimal like this and add, keeping the decimal in place.

24621.000000

+ 0.474862

- When you add you get:

24621.000000

+ 0.474862

24621.474862

Type in 24621.474862.

---

11) Assignment #234681 "234681 - 208585 - Subtraction of Decimals - D"

What is  $8.3 - 7.7$ ?

Fill in:

✓ 0.6

✓ .6

Hints:

- When subtracting decimals you need to subtract the ones from the ones. The tenths from the tenths. AND SO ON.

You must line up the decimal to do this:

- Line up the numbers like this and subtract. Make sure the decimal is in the same place in the answer!

8.3

$$\underline{-7.7}$$

- When you subtract you get:

$$\begin{array}{r} 8.3 \\ - 7.7 \\ \hline 0.6 \end{array}$$

Type in 0.6.

**12) Assisment #234691 "234691 - 194969 - Mika - Addition of decimals - Range 001 and 100"**

What is  $452.237 + 313.446$ ?

Fill in:

✓ 765.683

Hints:

- When adding you need to add the ones with the ones. The tenths with the tenths. AND SO ON.

You must line up the decimal to do this.

- In this case we line up the decimal like this and add, keeping the decimal in place.

$$\begin{array}{r} 452.237 \\ + 313.446 \\ \hline \end{array}$$

- When you add you get:

$$\begin{array}{r} 452.237 \\ + 313.446 \\ \hline 765.683 \end{array}$$

Type in 765.683.

**13) Assisment #234701 "234701 - Addition of decimals - Tenths place + Thousandths place"**

What is  $35.4 + 7.243$ ?

Fill in:

✓ 42.643

**Hints:**

- When adding you need to add the ones with the ones. The tenths with the tenths. AND SO ON.

You must line up the decimal to do this.

- In this case we add 0 hundredths and 0 thousandths to 35.4. This does not change the value of the number.

Line up the decimal like this and add, keeping the decimal in place.

35.400

+ 7.243

- When you add you get:

35.400

+ 7.243

42.643

Type in 42.643.

---

**14) Assignment #234711 "234711 - 208597 - Subtraction of Decimals - F"**

What is  $64.25 - 10.72$ ?

Fill in:

✓ 53.53

✓ 53.53

**Hints:**

- When subtracting decimals you need to subtract the ones from the ones. The tenths from the tenths. AND SO ON.

You must line up the decimal to do this.

- Line up the numbers like this and subtract. Make sure the decimal is in the same place in the answer!

64.25

- 10.72

- When you subtract you get:

64.25

- 10.72

53.53

Type in 53.53.

---

15) Assignment #234721 "234721 - 208586 - Subtraction of Decimals - E"

What is  $5 - 4.3$ ?

Fill in:

✓ 0.7

✓ .7

Hints:

- When subtracting decimals you need to subtract the **ones from the ones**. The **tenths from the tenths**. AND SO ON.

You must line up the decimal to do this.

- In this case, add 0 tenths to 5. This does not change the value of the number.  
Line up the numbers like this and subtract. Make sure the decimal is in the same place in the answer!

5.0

- 4.3

- When you subtract you get:

5.0

- 4.3

0.7

Type in 0.7.

---

16) Assignment #234731 "234731 - 198620 - Subtraction of Decimals - C"

What is  $58170 - 0.003663$ ?

Fill in:

✓ 58169.996337

Hints:

- Before subtracting, write the decimal numbers one right under the other, lining up the decimal points.
- When you align your decimals you should end with something that looks like this:



58170 000000

0 003663

\_\_\_\_\_

Perform the subtraction and enter your answer.

- After we perform the subtraction, you should get something like this:

58170 000000

0 003663

\_\_\_\_\_

58169 996337

The answer is 58169 996337, type in 58169 996337 and submit.

---

17) Assignment #234741 "234741 - 194969 - Milka - Addition of decimals - Range 001 and 100"

What is  $427.45 + 426.204$ ?

Fill in:

✓ 853.654

Hints:

- When adding you need to add the ones with the ones. The tenths with the tenths. AND SO ON.

You must line up the decimal to do this:

- In this case we add 0 thousandths to 427.45. This does not change the value of the number.

Line up the decimal like this and add, keeping the decimal in place.

427.450

+ 426.204

- When you add you get:

427.450

$$\begin{array}{r} + 426.204 \\ 853.654 \end{array}$$

Type in 853.654.

**18) Assignment #234751 "234751 - Addition of decimals - Tenths place + Thousandths place"**

What is  $86.3 + 375.587$ ?

**Fill in:**

✓ 461.887

**Hints:**

- When adding you need to add the ones with the ones. The tenths with the tenths. AND SO ON.

You must line up the decimal to do this:

- In this case we add 0 hundredths and 0 thousandths to 86.3. This does not change the value of the number.

Line up the decimal like this and add, keeping the decimal in place.

$$\begin{array}{r} 86.300 \\ + 375.587 \end{array}$$

- When you add you get:

$$\begin{array}{r} 86.300 \\ + 375.587 \\ 461.887 \end{array}$$

Type in 461.887.

## Multiplying and Dividing Decimals

### Problem Set "Multiplying and Dividing Decimals " id:[41462]

#### 1) Assisment #230594 '230594 - Multiplying Decimals'

What is  $9.4 \times 0.41$ ?

Fill in:

✓ 3.854

Hints:

- Multiply the numbers **without the decimals**.
- **Count the numbers to the right of the decimal point** on both numbers being multiplied.
- After counting, have that amount of numbers **after the decimal in your answer**.

$$\begin{array}{r} 0.41 \\ \times 9.40 \\ \hline 3.854 \end{array}$$

Type in 3.854

#### 2) Assisment #230604 '230604 - 206252 - Dividing a Decimal by a Whole Number'

What is  $367.84 \div 968$ ?

Fill in:

✓ 0.38

Hints:

- Put the decimal point in the answer directly above the decimal point in the dividend and now do the division problem as if there were no decimal there.

$$\begin{array}{r} \overline{) 968 \overline{) 367.84}} \\ 0. \\ \hline 968 \overline{) 367.84} \\ \underline{-0} \\ 3678 \\ \hline 0.3 \\ \hline 968 \overline{) 367.84} \\ \underline{-0} \\ 3678 \\ \underline{-2904} \\ 7744 \end{array}$$

- $$\begin{array}{r}
 0.38 \\
 968 \overline{) 367.84} \\
 \underline{-0} \\
 3678 \\
 \underline{-2904} \\
 7744 \\
 \underline{-7744} \\
 0
 \end{array}$$

Please type 0.38

### 3) Assignment #230614 '230614 - 205631 - 194969 - Milka - Multiplication of decimals - Range 001 and 100'

Multiply 0.56 and 0.78, rounding the answer to the nearest thousandth.

Fill in:

✓ 0.437

Hints:

- First, multiply 56 by 78, ignoring the decimal points.

$$\begin{array}{r}
 0.56 \\
 * 0.78 \\
 \hline
 448 \\
 392 \\
 \hline
 \end{array}$$

- Then count the total number of decimal places in the factors and add them.

0.56 <---- Two decimal place

\* 0.78 <---- Two decimal place

$$\begin{array}{r}
 448 \\
 392 \\
 \hline
 \end{array}$$

0.4368 <---- Four decimal places in the product

Without rounding, the answer is 0.4368. Remember to round to the thousandths place. If number in the ten thousandths is less than 5 then round down.

- When you multiply and round to the nearest thousandth you get:

0.56 <---- Two decimal place

\* 0.78 <---- Two decimal place

0.437 <---- Four decimal places in the product

Type in 0.437 and click submit.

---

4) Assignment #230624 '230624 - 205620 - Multiplication of decimals - Tenth's place'

Multiply:  $4.3 * 7.8$ ?

Fill in:

✓ 33.54

Hints:

- First, multiply 43 by 78, ignoring the decimal point.

$$\begin{array}{r} 4.3 \\ * 7.8 \\ \hline 344 \\ 301\phantom{0} \\ \hline 3354 \end{array}$$

- Then count the total number of decimal places in the factors and add them.

$$\begin{array}{r} 4.3 <--- \text{Two decimal place} \\ * 7.8 <--- \text{Two decimal place} \\ \hline 344 \\ 301\phantom{0} \\ \hline 3354 <--- \text{Four decimal places in the product} \end{array}$$

- Insert the decimal point two places from the right end.

$$\begin{array}{r} 4.3 <--- \text{Two decimal place} \\ * 7.8 <--- \text{Two decimal place} \\ \hline 344 \\ 301\phantom{0} \\ \hline 33.54 <--- \text{Four decimal places in the product} \end{array}$$

So 33.54 is the product.

---

5) Assignment #230634 '230634 - 219271 - Dividing a Decimal by a Decimal'

What is  $0.24 \div 0.2$ ?

Fill in:

✓ 1.2

Hints:

- 

$$0.2 \overline{)0.24}$$

Move the decimal point in the divisor (outside number) to the right until it becomes a whole number.

Then move the decimal point in the dividend (inside number) to the right the same number for places.

$$\begin{array}{r} \text{---} \\ 2 \overline{) 2.4} \end{array}$$

• Put the decimal point in the answer directly above the decimal point in the dividend and now do the division problem as if there were no decimal there.

$$\begin{array}{r} \text{---} \\ 2 \overline{) 2.4} \end{array}$$

$$\begin{array}{r} \text{---} \\ 2 \overline{) 2.4} \\ \underline{-2} \phantom{0} \\ 4 \end{array}$$

$$\begin{array}{r} \text{---} \\ 2 \overline{) 2.4} \\ \underline{-2} \phantom{0} \\ 4 \\ \underline{-4} \\ 0 \end{array}$$

Please type 1.2

---

**6) Assistent #230654 '230654 - 223055 - Word Problem'**

A town is hosting a charity concert. Every person that goes to the concert pays \$19.50 to attend. At the end of the concert the town raised \$10062.00.

If everyone that attended the concert paid the fee, how many people attended the concert?

**Fill in:**

✓ 516

**Hints:**

- Each person is paying \$19.50 to attend.

In order to find the total amount of people you will need to divide \$10062.00 by \$19.50

- $\$10062.00 \div \$19.50 = 516$ .

Please enter 516.

---

**7) Assistent #230664 '230664 - Multiplying Decimals'**

What is  $0.79 \times 0.36$ ?

Fill in:

✓ 0.2844

✓ .2844

Hints:

- Multiply the numbers **without the decimals**.

$$79 \times 36 = ?$$

- Count the digits to the right of the decimal point on both numbers being multiplied.

0.79 has 2 digits after the decimal.

0.36 has 2 digits after the decimal.

So you should have 4 digits after the decimal in your answer. (The sum of 2 and 2)

- $79 \times 36 = 2844$ .

Now just move the decimal to the left 4 places.

- $0.79 \times 0.36 = 0.2844$

Type in 0.2844

---

8) Assignment #230674 "230674 - 219354 - Word Problems arithmetic addition"

Kevin was planning a trip to Ghana. Before taking his bags to the airport, he decided to weigh them so that he wouldn't go over the 1000 kilogram maximum. Kevin put 9 packages on a scale which individually weighed 42.79 kilograms. What was on his scale display?

Round to the nearest kilogram.

Fill in:

✓ 385

Hints:

- Each package weighed 42.79 kilograms and there were 9 of them.  
First determine how much the packages weighed total?

- Since there were 9 packages and each of them weighed 42.79 kilograms:

$$9 \text{ packages} \times \frac{42.79 \text{ kilograms}}{1 \text{ package}} = 385.11 \text{ kilogram}$$

- Remember to round to the nearest whole number.

..

So:

$$9 \text{ packages} * \frac{42.79 \text{ kilograms}}{1 \text{ package}} = 385.11 \text{ kilograms}$$

385.11 kilograms rounded to the nearest whole number is 385 kilograms. Type in 385 and click submit.

---

9) Assignment #230687 "230687 - Dividing a Decimal by a Decimal"

What is  $5.478 \div 2.2$ ?

Fill in:

✓ 2.49

Hints:

•

$$\begin{array}{r} \phantom{00} \\ 2.2 \overline{) 5.478} \end{array}$$

Move the decimal point in the divisor (outside number) to the right until it becomes a whole number. Then move the decimal point in the dividend (inside number) to the right the same number of places.

$$\begin{array}{r} \phantom{00} \\ 22 \overline{) 54.78} \end{array}$$

•

Put the decimal point in the answer directly above the decimal point in the dividend and now do the division problem as if there were no decimal there.

$$\begin{array}{r} \phantom{00} \\ 22 \overline{) 54.78} \end{array}$$

•

$$\begin{array}{r} \phantom{00} \underline{2} \phantom{0} \\ 22 \overline{) 54.78} \\ \underline{-44} \phantom{0} \\ 107 \phantom{0} \end{array}$$

•

$$\begin{array}{r} \phantom{00} \underline{24} \phantom{0} \\ 22 \overline{) 54.78} \\ \underline{-44} \phantom{0} \\ 107 \phantom{0} \\ \underline{-88} \phantom{0} \\ 198 \phantom{0} \end{array}$$

•

$$\begin{array}{r} \phantom{00} \underline{2.49} \phantom{0} \\ 22 \overline{) 54.78} \end{array}$$



$$\begin{array}{r}
 -44 \\
 107 \\
 -88 \\
 198 \\
 -198 \\
 \hline
 0
 \end{array}$$

Please type 2.49

---

**10) Assignment #230708 "230708 - 205620 - Multiplication of decimals - Tenth place"**

Find the product of 7.2 and 4

**Fill in:**

✓ 28.8

**Hints:**

- Let's multiply 7.2 by 4, ignoring the decimal point.

$$\begin{array}{r}
 7.2 \\
 * 4 \\
 \hline
 288
 \end{array}$$

- Count the total number of decimal places and add them.

$$\begin{array}{r}
 7.2 \leftarrow \text{Two decimal place} \\
 * 4 \leftarrow \text{Zero decimal places (4 is a whole number)} \\
 \hline
 28.8
 \end{array}$$

- Insert the decimal point two places from the right end.

$$\begin{array}{r}
 7.2 \leftarrow \text{One decimal place} \\
 * 4 \leftarrow \text{Zero decimal places (4 is a whole number)} \\
 \hline
 28.8 \leftarrow \text{One decimal places in the product}
 \end{array}$$

So 28.8 is the product. Type 28.8 and click submit.

---

**11) Assignment #230729 "230729 - 222045 - Word Problem"**

A shopper buys four pumpkins for Halloween. The pumpkins weigh 1.3 pounds, 1.7 pounds, 2.8 pounds, and 1.6 pounds.

How much less than the average weight of the four pumpkins was the weight of the lightest one?

**Fill in:**

✓ 0.55

**Hints:**

- To solve this problem you will need to find the average weight of the four pumpkins as well as which pumpkin is the smallest. Then you must subtract the smallest weight from the average.

First, find the lightest weighing pumpkin.

- The weight of the lightest pumpkin is **1.3** pounds.

Next, find the average weight of all the pumpkins.

- To find the average, sum the four weights and divide by four.

$$\text{Sum} = 1.3 + 1.7 + 2.8 + 1.6$$

$$\text{Sum} = 7.4$$

$$\text{Average} = 7.4/4$$

$$\text{Average} = 1.85$$

- The average pumpkin weight is **1.85** pounds.

Now you must subtract the lightest pumpkin weight from the average pumpkin weight.

$$1.85 - 1.3 = 0.55$$

---

**12) Assignment #230747 "230747 - Multiplying Decimals"**

What is  $7.1 \times 12.7$ ?

**Fill in:**

✓ 90.17

**Hints:**

- Multiply the numbers **without the decimals**.

$$71 \times 127 = ?$$

- **Count the digits to the right of the decimal point** on both numbers being multiplied.

7.1 has **1** digit after the decimal.

12.7 has **1** digit after the decimal.

So you should have **2** digits after the decimal in your answer. (The sum of 1 and 1)

- $71 \times 127 = 9017$ .

Now just move the decimal to the left 2 places.

- $7.1 \times 12.7 = 90.17$

Type in 90.17

---

**13) Assignment #230769 "230769 - 223046 - Word Problem"**

A baseball player got 1263 hits in 9860 times at bat. What is his batting average rounded to the nearest

A baseball player got 1263 hits in 9869 times at bat. What is his batting average rounded to the nearest thousandths place?

Fill in:

✓ 0.128

Hints:

- To find the batting average you will need to divide the hits by the times at bat.
- Batting Average =  $1263 \div 9869$   
It may help to get a piece of paper and do the long division out.
- The batting average rounded to the thousandths place is 0.128. Please enter 0.128.

#### 14) Assignment #230803 "230803 - Dividing a Decimal by a Whole Number"

What is  $69.93 \div 63$ ?

Fill in:

✓ 1.11

Hints:

- Put the decimal point in the answer directly above the decimal point in the dividend and now do the division problem as if there were no decimal there.

$$\begin{array}{r} \phantom{00} \\ 63 \overline{) 69.93} \end{array}$$

$$\begin{array}{r} \phantom{00} \\ 63 \overline{) 69.93} \\ \underline{-63} \phantom{00} \\ 69 \phantom{00} \end{array}$$

$$\begin{array}{r} \phantom{00} \\ 63 \overline{) 69.93} \\ \underline{-63} \phantom{00} \\ 69 \phantom{00} \\ \underline{-63} \phantom{00} \\ 63 \phantom{00} \end{array}$$

$$\begin{array}{r} \phantom{00} \\ 63 \overline{) 69.93} \\ \underline{-63} \phantom{00} \\ 69 \phantom{00} \\ \underline{-63} \phantom{00} \\ 63 \phantom{00} \end{array}$$

$$\begin{array}{r} \phantom{00} \\ 63 \overline{) 69.93} \\ \underline{-63} \phantom{00} \\ 69 \phantom{00} \\ \underline{-63} \phantom{00} \\ 63 \phantom{00} \\ \underline{-63} \phantom{00} \\ 0 \phantom{00} \end{array}$$

Please type 1.11

## Multiplication and Division by Powers of 10

**Problem Set "Multiplication and Division by Powers of 10 "** id:[41464]

**1) Assisment #225303 '225303 - Division by powers of 10 - Tens and tenths'**

What is  $8.8 \div 0.1$ ?

**Fill in:**

✓ 88

✓ 88

**Hints:**

- Dividing a number by 0.1 is the same as multiplying it by 10. You just move the decimal one place to the right.

Think of it this way: How many 0.1s in 8.8?

- $8.8 \div 0.1 = 88$ . Type in 88.

---

**2) Assisment #225313 '225313 - 154332 - 111978 - Multiplication by positive powers of 10 - no decimals'**

What is  $41 \times 10$ ?

**Fill in:**

✓ 410

✓ 410

**Hints:**

- Whenever you multiply a whole number by 10, all you need to do is add a zero to the end.
- For example,  $5 \times 10 = 50$ , and  $47 \times 10 = 470$ . So what do you get when you add a zero to the end of 41?
- $41 \times 10 = 410$ . So type in 410.

---

**3) Assisment #225323 '225323 - Division by positive powers of 10'**

What is  $152.7 \div 10$ ?

**Fill in:**

✓ 15.27

✓ 15.27

**Hints:**

- When dividing a number by 10, you just move the decimal one place to the left.

Think of it this way: How many 10s in 152.7?

- $152.7 \div 10 = 15.27$ . Type in 15.27.

4) Assisment #225333 '225333 - 125734 - Multiplication by powers of 10 - Negative powers often'

What is  $534.8 \times 0.001$ ?

Fill in:

✓ 0.5348

✓ .5348

Hints:

- When you multiply a number by 0.001, you just move the decimal three places to the left.
- $534.8 \times 0.001 = 0.5348$ . Type in 0.5348.

---

5) Assisment #225343 '225343 - 132593 - Multiplication by positive powers of 10 - Working backwards'

Fill in the blank with a power of 10:

$$98.06 \times \underline{\hspace{1cm}} = 9806$$

Algebra:

✓ 100

Hints:

- Here's a table for multiplying by powers of 10:

Moves the decimal	one place	two places	three places
to the right	10	100	1000
to the left	0.1	0.01	0.001

Which one will turn 98.06 into 9806?

- $98.06 \times 100 = 9806$ . Type in 100.

---

6) Assisment #225353 '225353 - 132594 - 126817 - Division by positive powers of 10 - Working backwards'

Fill in the blank with a power of 10:

$$87.34 \div \underline{\hspace{1cm}} = 0.8734$$

Algebra:

✓ 100

Hints:

- Here's a table for dividing by powers of 10:

Moves the decimal	one place	two places	three places
to the left	10	100	1000
to the right	0.1	0.01	0.001

Which one will turn 87.34 into 0.8734?

- $87.34 \div 100 = 0.8734$ . Type in 100.

---

7) Assignment #225363 '225363 - Multiplication by powers of 10 - Adding zeroes'

What is  $1.3 \times 1000$ ?

Fill in:

✓ 1300

✓ 1300

Hints:

- When you multiply a number by 1000, you just move the decimal 3 places to the right.

When there are no more numbers to the right of the decimal, put a 0 there instead.

- $1.3 \times 1000 = 1300$ . Type in 1300.

---

8) Assignment #225373 '225373 - Multiplication by powers of 10 - Working backwards'

Fill in the blank with a power of 10:

$$19.73 \times \underline{\hspace{1cm}} = 1973$$

Fill in:

✓ 100

✓ 100

Hints:

- Here's a table for multiplying by powers of 10:

Moves the decimal	one place	two places	three places
to the right	10	100	1000
to the left	0.1	0.01	0.001

Which one will turn 19.73 into 1973?

- $19.73 \times 100 = 1973$ . Type in 100.

---

9) Assignment #225383 "225383 - 126817 - Division by powers of 10 - Working backwards"

Fill in the blank with a power of 10:

$$68.84 \div \underline{\hspace{1cm}} = 6.884$$

Fill in:

✓ 10

✓ 10

Hints:

- Here's a table for dividing by powers of 10:

Moves the decimal	one place	two places	three places
to the left	10	100	1000
to the right	0.1	0.01	0.001

Which one will turn 68.84 into 6.884?

- $68.84 \div 10 = 6.884$ . Type in 10.

---

10) Assignment #225393 "225393 - 125385 - Multiplication by powers of 10 - Tens and tens"

What is  $36.11 \times 10$ ?

Fill in:

✓ 361.1

✓ 361.1

Hints:

- When you multiply a number by 10, you just move the decimal one place to the right.
- $36.11 \times 10 = 361.1$ . Type in 361.1.

---

11) Assignment #225403 "225403 - 126178 - Division by negative powers of 10"

What is  $5.438 \div 0.01$ ?

**Fill in:**

✓ 543.8

**Hints:**

- When dividing a number by 0.01, you just move the decimal two places to the right.

Think of it this way: How many 0.01s in 5.438?

- $5.438 \div 0.01 = 543.8$ . Type in 543.8.
- 

**12) Assignment #225413 "225413 - 125399 - Multiplication by powers of 10 - Positive powers of 10"**

What is  $109.67 \times 10$ ?

**Fill in:**

✓ 1096.7

**Hints:**

- When you multiply a number by 10, you just move the decimal one place to the right.
  - $109.67 \times 10 = 1096.7$ . Type in 1096.7.
-



## Percents

### Problem Set "Percents" id:[41466]

#### 1) Assignment #232712 "232712 - Percent "

38 is 35% of what number?

Round to the nearest hundredth.

Algebra:

✓ 108.57

Hints:

- 35% is the same as  $35/100$ .

You can rewrite the problem as a proportion problem:

$$\frac{38}{x} = \frac{35}{100}$$

where  $x$  is the whole, so it's across from 100, and 38 is the part, so it's across from 35.

- Multiply both sides by  $100x$  so that you get

$$3800 = 35x$$

and then solve for  $x$ .

Don't forget to round!

- $3800 = 35x$

$$3800/35 = x$$

$$x = 108.571428571429$$

Rounded, the answer is 108.57.

38 is 35% of 108.57.

---

#### 2) Assignment #232722 "232722 - Percent "

2 is what percent of 17?

If necessary, round your answer to the nearest percent.

Enter your answer without a percent sign.

**Algebra:**

- ✓ 12
- ✓ 12%

**Hints:**

- This is how to solve a problem similar to your problem.

6 is what percent of 20?

$$6 \div 20 = 0.3$$

$$0.3 = 30\%$$

- The first step in finding the percent is dividing 2 by 17.

$$2 \div 17 = 0.117647058823529$$

- The last step is to convert 0.117647058823529 to a percent and then round it to the nearest percent.

$$0.117647058823529 = 12\%$$

Type in 12

---

**3) Assignment #232752 "Percent"**

Ryan has 284 gumballs. He decides to give 39% of them to a friend as a birthday present. How many gumballs does Ryan give away?

**Round your answer to the nearest whole number.**

**Algebra:**

- ✓ 111

**Hints:**

- When dealing with percents, use this equation:

$$\text{Part} = \text{Percent} \times \text{Whole}$$

In this case, you're given the whole (284) and the percent (39%, or 0.39).

Use these to find the part.

- Substitute the given values into the equation:

$$\text{Part} = 0.39 \times 284$$

Now solve for part.

Remember to round afterwards!

$$\text{Part} = 0.39 \times 284$$

$$\bullet \text{ Part} = 0.37 \times 304$$

$$\text{Part} = 110.76$$

Rounded, the answer is 111.

Ryan gives away 111 gumballs.

#### 4) Assisment #232762 '232762 - Percent'

A student is doing a reading assignment. After 23 minutes of reading, she skims the pages ahead and estimates that she still has 54% of the reading to do. According to the girl's estimate, how long is the total reading assignment? Round to the nearest minute.

**Algebra:**

✓ 50

**Hints:**

- This is a Part = Percent  $\times$  Whole problem, with a twist: the given part doesn't correspond to the given percent.

After 23 minutes, there's 54% of the reading *left*.

- To find what percent of the whole 23 is, just subtract 54% from 100%.

$$100\% - 54\% = 46\%$$

Now that you have the part with its corresponding percent, you can use these to find the whole.

- When dealing with percents, use the following equation:

$$\text{Part} = \text{Percent} \times \text{Whole}$$

In this case, you know the part (23) and the percent (46%, or 0.46). Use these to find the whole.

- Substitute 23 and 0.46 into the equation:

$$23 = 0.46 \times \text{Whole}$$

Now solve the equation for Whole.

Don't forget to round it afterwards!

$$\bullet \text{ } 23 = 0.46 \times \text{Whole}$$

$$23/0.46 = \text{Whole}$$

$$\text{Whole} = 50.$$

Rounded, the Whole is 50.

The reading takes 50 minutes to complete.

---

5) Assignment #232772 'Percent'

A student is downloading his digital textbook. After 41 minutes, he's dismayed to find that there's still 61% of the download left. How long, to the nearest minute, is the total download?

Algebra:

✓ 105

Hints:

- This is a percent problem, with a twist: the given percent is not the one associated with the given part.

After 41 minutes, there's 61% of the download left.

- To find what percent of the whole 41 is, just subtract 61% from 100%.

$$100\% - 61\% = 39\%$$

Now that you have the part with its corresponding percent, you can use these to find the whole.

- 39% is the same as 39/100.

You can rewrite the problem as a proportion problem:

$$\frac{41}{x} = \frac{39}{100}$$

where x is the whole, so it's across from 100, and 41 is the part, so it's across from 39.

- Multiply both sides by 100x so that you get

$$4100 = 39x$$

and then solve for x.

Don't forget to round!

- $4100 = 39x$

$$4100/39 = x$$

$$x = 105.128205128205$$

Rounded, the answer is 105.

The length of the download is 105 minutes.

---

6) Assignment #232782 'Percent'

Rebecca went shopping with \$126 in her pocket, but she didn't want to spend it all. She decided to spend 11% of her money at most, and save the rest for later. How much was Rebecca willing to spend?

**Algebra:**

✓ 13.86

✓ \$13.86

✓ 13.86 dollars

**Hints:**

- 11% is the same as 11/100.

Rewrite the problem as:

$$\frac{11}{100} = \frac{x}{126}$$

where  $x$  is the part, so it's across from 11, and 126 is the whole, so it's across from 100.

- Multiply both sides of the above equation by  $126 \times 100$ , so you get:

$$11 \times 126 = 100x$$

Now solve for  $x$ .

- $11 \times 126 = 100x$

$$1386 = 100x$$

$$1386/100 = x$$

$$x = 13.86$$

Rebecca was willing to spend \$13.86.

---

**7) Assignment #232795 "232795 - Percent"**

A mountaineer is making his way up a cliff. About 46 feet up, he looks up and estimates that he's climbed about 63% of the cliff. Assuming he's correct, how high is the cliff? Round to the nearest foot.

**Algebra:**

✓ 73

**Hints:**

- When dealing with percents, use the following equation:

$$\text{Part} = \text{Percent} \times \text{Whole}$$

In this case, you're given the part (46) and the percent (63%, or 0.63). Use these to find the whole.

- Substitute 46 and 0.63 into the equation:

$$46 = 0.63 \times \text{Whole}$$

Now solve the equation for Whole.

Don't forget to round it afterwards!

$$\bullet 46 = 0.63 \times \text{Whole}$$

$$46/0.63 = \text{Whole}$$

$$\text{Whole} = 73.015873015873.$$

Rounded, the Whole is 73.

46 is 63% of 73.

---

**8) Assisment #232802 "232802 - Percent"**

Over the course of a year, the population of raccoons in Phoenix increased from 300000 to 333000. What was the percent increase of the population of raccoons?

Enter the answer without the percent sign.

For example, if the answer is 15%, enter 15.

**Algebra:**

✓ 11

**Hints:**

- The percent increase is the number of additional raccoons after 1 year divided by the initial population of raccoons.
- The equation to find the percent increase is:

$$\text{Percent Increase (\%)} = \frac{\text{Final Population} - \text{Initial Population}}{\text{Initial Population}} \times 100$$

•

$$\text{Percent Increase (\%)} = \frac{333000 - 300000}{300000} \times 100$$

$$\text{Percent Increase (\%)} = \frac{33000}{300000} \times 100$$

$$\text{Percent Increase (\%)} = 0.11 \times 100$$

$$\text{Percent Increase (\%)} = 11\%$$

The percent increase of the population of raccoons is 11%

9) Assignment #232812 "232812 - Percent"

A boy saves up \$98 for a gift for his friend. However, upon reaching the store, he realizes that he saved 143% of the actual amount he needed to buy the present. How much does the present cost? Round to the nearest cent.

Algebra:

✓ 68.53

Hints:

- This is a Part = Percent  $\times$  Whole problem.

You're given the part (98) and the percent (143%, or 1.43).

Substitute these into the equation to find the whole.

- $98 = 1.43 \times \text{Whole}$

Whole =  $98/1.43$

What is  $98/1.43$ ?

Don't forget to round your answer!

- $98/1.43 = 68.53$

The present costs \$68.53.

10) Assignment #232822 "232822 - Percent"

What is 68% of 90?

Algebra:

✓ 61.2

Hints:

- The first step is to convert 68% to a decimal. You do this by removing the percentage sign and move the decimal two spaces to the left.

68% = 0.68

- Next you have to multiply 0.68 by 90 to find the answer. This will give you 68% of 90.

- $0.68 \times 90 = 61.2$

Type in 61.2

---

**11) Assignment #232833 "232833 - Percent"**

Best Buy is having a sale on computers. Andrew picks out a computer that was originally \$799.99

If the computer is 15% off, What is the final price of the computer?

Round to the nearest penny.

**Fill in:**

✓ 679.99

**Hints:**

- To solve the problem, first convert the percent to a decimal.

$$15\% = 0.15$$

Then try and find how much money the computer was reduced by.

- To find the amount of money off the computer was, multiply the decimal percent by the total cost.

$$799.99 \times 0.15 = 119.9985$$

Andrew gets \$119.9985 off the computer.

(wait to round until the end!)

- Finally, to find the final price of the computer, subtract the amount off from the total cost.

$$799.99 - 119.9985 = 679.9915$$

Make sure you round the price to the nearest penny:

$$679.9915 = \$679.99$$

The final price of the computer is \$679.99.

Type in 679.99

---

**12) Assignment #232842 "232842 - Percent"**

68 is 218% of what number?

**Round your answer to the nearest hundredth.**

**Algebra:**

✓ 31.19

**Hints:**

- This is a Part = Percent  $\times$  Whole problem.

You're given the part (68) and the percent (218%, or 2.18).

Substitute these into the equation to find the whole.

$$68 = 2.18 \times \text{Whole}$$

$$\text{Whole} = 68/2.18$$

What is 68/2.18?



Don't forget to round your answer!

•  $68/2.18 = 31.19$

68 is 218% of 31.19.

---

**13) Assignment #232855 "232855 - Percent"**

Emily is running a lemonade stand. She expects to make \$127 for the day, but ends up making 260% of that amount. How much money did Emily make that day? Enter the answer without a dollar sign.

**Fill in:**

✓ 330.2

✓ 330.20

✓ \$330.20

✓ \$330.2

**Hints:**

- This is a Part = Percent  $\times$  Whole problem.

You're given the percent (260%, or 2.6) and the whole (127).

Substitute these into the equation to find the part.

- Part =  $2.6 \times 127$

$$\text{Part} = 330.2$$

Emily made \$330.2.

Type in 330.2.

---

**14) Assignment #232865 "232865 - Percent"**

A constructor is measuring the perimeter of a plot for a building. 74% of the way around the perimeter, the constructor has measured 13 meters. How far around is the entire perimeter? Round your answer to the nearest hundredth.

**Algebra:**

✓ 17.57

**Hints:**

- 74% is the same as  $74/100$ .

You can rewrite the problem as a proportion problem:

$$\frac{13}{x} = \frac{74}{100}$$

where  $x$  is the whole, so it's across from 100, and 13 is the part, so it's across from 74.

- Multiply both sides by 100x so that you get

$$1300 = 74x$$

and then solve for x.

Don't forget to round!

- $1300 = 74x$

$$1300/74 = x$$

$$x = 17.5675675675676$$

Rounded, the answer is 17.57.

The perimeter of the plot is 17.57 meters.

#### 15) Assignment #232884 "232884 - Percent"

There was a population of 360 eagles in a National Park. After a year, the population increased by 35%. How many eagles are there in the park now?

**Algebra:**

✓ 486

**Hints:**

- The problem gives you the percent increase of the population.

Start by converting the percent to a decimal.

$$35\% = 0.35$$

Now, use the decimal percent to find the how many more eagles there are in the park.

- You can find how many more eagles are in the park by multiplying the total number of eagles by the percent increase.

$$360 \times 0.35 = 126$$

There are 126 more eagles than there were last year.

- To find find out how many eagles are in the park now, add the population from last year to the eagles gained from the percent increase.

$$360 + 126 = 486$$

There are 486 eagles in the park now.

Type 486

#### 16) Assignment #232892 "232892 - Percent"

The farmer brought 20 apples to the market.

When the day was over, he had 45% less apples.

How many apples does the farmer have left?

**Fill in:**

✓ 11

✗ 9

- Almost! That is how many the farmer sold.

**Hints:**

- Start by figuring out how many apples the farmer sold.  
First, convert the percent to a decimal:  $45\% = 0.45$
- The number of apples the farmer sold is:  
 $20 \times 0.45 = 9$
- Now find out how many are left over. Subtract the number of sold apples from the total.  
 $20 - 9 = 11$

The farmer has 11 apples left.  
Type in 11.

---

## Proportion - Ratio - Rates

### Problem Set "Proportion - Ratio - Rates" id: [41467]

#### 1) Assignment #230683 "230683 - Unit rates - Distance Conversion: Inches to Yards"

A certain type of turtle moves an average of 244 inches per day. How many yards does this type of turtle move in a day? Round to the nearest hundredth.

Fill in:

✓ 6.78

#### Hints:

- This is a basic unit conversion problem. You need to convert from inches/day to yards/day. You can even ignore the 'per day' part, and just convert from inches to yards.
- Remember, there are 12 inches in a foot, and 3 feet in a yard.

So every yard is  $12 \times 3 = 36$  inches long.

- Now you can rewrite the problem as:

$$\frac{X \text{ yards}}{244 \text{ inches}} = \frac{1 \text{ yard}}{36 \text{ inches}}$$

where X is your answer.

To solve for X, multiply both sides by 244 and we get:

$$X = 244/36$$

You can find X by dividing:

$$X = 244 \div 36$$

Don't forget to round afterward!

- On average, this type of turtle moves 6.78 yards per day.

Type in 6.78.

#### 2) Assignment #230695 "230695 - Unit rates - Choose best buy from a list"

There are 3 stores currently offering deals on pens. Their deals are shown in the table below:

Pen Factory	12 pens for \$3
Pens, Pens, Pens!	90 pens for \$18
Writing Supplies Inc.	108 pens for \$18

Which store's deal offers the most pens per dollar?

Multiple choice:

✓ Writing Supplies Inc

✗ Pen Factory

✗ Pens, Pens, Pens!

Hints:

- This problem requires you to compare the rates of pens/dollar for several different stores.

Before you can compare these rates, you need to find them.

- To find the pens/dollar rate for each store, you need to divide the number of pens by the number of dollars.

So which is greatest: 12 pens/3 dollars, 90 pens/18 dollars, or 108 pens/18 dollars?

- $12/3 = 4$  pens/dollar

$$90/18 = 5 \text{ pens/dollar}$$

$$108/18 = 6 \text{ pens/dollar}$$

Writing Supplies Inc offers the most pens per dollar. Pick Writing Supplies Inc.

---

3) Assignment #230709 "230709 - 208352 - Unitrate - Exactrate"

A professional soccer player is dribbling a ball across a field. In 17 seconds, he's traveled 51 meters across the field. On average, how many meters did the soccer player move per second?

Fill in:

✓ 3

Hints:

- This is a unit rate problem.

You're trying to find the meters/second rate of the soccer player's movement.

Use the given information to determine the rate.

•

$$\frac{51 \text{ meters}}{17 \text{ seconds}} = \frac{51 \div 17 \text{ meters}}{17 \div 17 \text{ seconds}} = \frac{3 \text{ meters}}{1 \text{ second}}$$

- $51/17 = 3/1$

On average, the soccer player can run 3 meters/second.

---

4) Assignment #230722 "230722 - 208638 - Unitrates - Find and use the rate"

A company is restocking its stores with paper. They can restock 105 stores with 15 shipments.

How many stores can the company restock with 8 shipments of paper?

Fill in:

✓ 56

**Hints:**

- To find how many stores can be restocked by 8 shipments, you need to find the rate of store/shipment.

Use the given ratio of stores to shipments to do so.

- $105/15 = 7/1$ .

Each shipment can restock 7 stores.

Use this information to figure out how many stores can be restocked by 8 shipments.

- $8 \times 7 = 56$

8 shipments of paper can restock 56 stores.

Type in 56.

---

**5) Assisment #230736 '230736 - Setting Up Proportions'**

When doing the laundry, you use 21 cups of detergent for every 7 gallons of water. Which of the following equations can be used to calculate c, the number of cups of detergent needed when using 22 gallons of water?

A.  $\frac{7}{21} = \frac{c}{22}$

B.  $\frac{21}{7} = \frac{c}{22}$

C.  $\frac{7}{22} = \frac{c}{21}$

D.  $\frac{22}{21} = \frac{c}{7}$

**Multiple choice:**

☒ A

☒ B

☒ C

☒ D

**Hints:**

- The problem is about the following ratio

number of cups of detergent : number of gallons of water

- Line up the labels that are on the top and bottom of the fractions.

cups of detergent on the top

---

gallons of water on the bottom

- We know that 21 cups of detergent is needed for every 7 gallons of water used. This means that

$$21 : 7$$

or

21 cups of detergent

---

7 gallons of water

- We also know that c cups of detergent is needed for every 22 gallons of water used. This means that

$$c : 22$$

or

c cups of detergent

---

22 gallons of water

- Notice the labels on the two equations from the previous two hints are lined up on the top and bottom.

This means that the proportions are equal to each other. Therefore,

$$\frac{21}{7} = \frac{c}{22}$$

This is an equation that can be used to find c, the number of cups of detergent needed for 22 gallons of water. So the answer is B. Select B.

---

**6) Assignment #230754 - Unit rates - Population estimation: Size of group''**

Dave surveyed a hundred students at his school and discovered that 39 of them owned multiple pets.

Assuming this sample accurately represents the entire student population, how many of the 550 students at Dave's school own multiple pets? Round to the nearest whole number.

**Fill in:**

✓ 215

**Hints:**

- We need to solve the proportion:

$$\frac{39 \text{ students with multiple pets}}{100 \text{ students}} = \frac{X \text{ students with multiple pets}}{550 \text{ students}}$$

where X is the answer.

To solve for X, multiply both sides by 550:

$$\frac{39 \times 550}{100} = X$$

Don't forget to round afterward!

- $39 \times 550/100 = 215$

There are 215 students in Dave's school that own multiple pets.

---

**7) Assignment #230761 '230761 - Unit rates - Population estimation: Size of group'**

Billy surveyed a hundred students at his school and discovered that 51 of them owned multiple pets.

Assuming this sample accurately represents the entire student population, how many of the 360 students at Billy's school own multiple pets? Round to the nearest whole number.

**Fill in:**

✓ 184

**Hints:**

- We need to solve the proportion:

$$\frac{51 \text{ students with multiple pets}}{100 \text{ students}} = \frac{X \text{ students with multiple pets}}{360 \text{ students}}$$

where X is the answer.

To solve for X, multiply both sides by 360:

$$\frac{51 \times 360}{100} = X$$

Don't forget to round afterward!

- $51 \times 360/100 = 184$

There are 184 students in Billy's school that own multiple pets.



---

8) Assignment #230775 "230775 - 208831 - Express the ratio ..."

Express the ratio 32 buses to 18 buses in simplest form.

Express your answer in ratio form.

Example:

1:2

with no spaces.

Fill in:

✓ 16:9

✓ 16 : 9

✓ 16: 9

✓ 16 :9

Hints:

- One way to represent this ratio 32 buses to 18 buses, is expressed as a fraction

$$\frac{32 \text{ buses}}{18 \text{ buses}}$$

First let's try to find the greatest common factor to simplify this problem.

•

Now let's simplify the problem to lowest terms.

The greatest common factor between 32 and 18 is 2.

$$32 \div 2 = 16 \text{ and } 18 \div 2 = 9$$

So  $\frac{16 \text{ buses}}{9 \text{ buses}}$  is the simplified ratio.

- Now rewrite the ratio in the colon notation. Note, 32 buses : 18 buses is simplified as 16 buses : 9 buses.

Type in 16:9 and click submit.

Remember we write our answers as a comparison of two numbers instead of an improper fraction.

---

9) Assignment #230796 "230796 - Setting Up Proportions"

When doing the laundry, you use 8 cups of detergent for every 10 gallons of water. Which of the following equations can be used to calculate c, the number of cups of detergent needed when using 17 gallons of

water?

A.  $\frac{8}{10} = \frac{17}{c}$

B.  $\frac{8}{17} = \frac{10}{c}$

C.  $\frac{8}{10} = \frac{c}{17}$

D.  $\frac{17}{8} = \frac{c}{10}$

Multiple choice:

☒ A

☒ B

☒ C

☒ D

Hints:

- The problem is about the following ratio

number of cups of detergent : number of gallons of water

- Line up the labels that are on the top and bottom of the fractions.

cups of detergent on the top

gallons of water on the bottom

- We know that 8 cups of detergent is needed for every 10 gallons of water used. This means that

8 : 10

or

8 cups of detergent

10 gallons of water

- We also know that  $c$  cups of detergent is needed for every 17 gallons of water used. This means that

$$c : 17$$

or

$c$  cups of detergent

17 gallons of water

- The labels on the two equations from the previous two hints are lined up on the top and bottom.

This means that the proportions are equal to each other. Therefore,

$$\frac{8}{10} = \frac{c}{17}$$

This is an equation that can be used to find  $c$ , the number of cups of detergent needed for 17 gallons of water. So the answer is C. Select C.

#### 10) Assignment #230813 "230813 - Unit rate - Rounded rate"

A group of 12 people make \$76 in a bake sale, and decide to split it evenly between them. About how much money does each person get? Round to the nearest cent.

Fill in:

- ✓ 6.33
- ✓ 6.330
- ✓ 6.3300

Hints:

- This is a unit rate problem.

You're trying to find the dollars/person rate of the bake sale profits.

Use the given information to determine the rate.

$$\frac{76 \text{ dollars}}{12 \text{ people}} = \frac{76 \text{ dollars} \div 12 \text{ people}}{12 \text{ people} \div 12 \text{ people}} = \frac{6.33 \text{ dollars/person}}{1}$$

- Rounded,  $76/12 = 6.33/1$

Each person gets about \$6.33.

Type in 6.33.

---

**11) Assignment #230828 "230828 - Unit rates - Population Estimation: Size of population"**

At a certain hotel, there must be 2 staff on duty for every 10 occupied rooms. When the hotel is full, this rule dictates that 95 staff members be on duty. How many rooms does the hotel have?

Fill in:

✓ 475

**Hints:**

- This is a rate problem. This hotel has a rate of 2 staff per 10 occupied rooms. You need to find how many rooms that means for 95 staff.
- You can rewrite the problem as

$$\frac{2}{10} = \frac{95}{x}$$

where  $x$  is the number of rooms in the hotel.

You can find your answer by solving for  $x$ .

- To solve for  $x$ , you should get it on its own on one side of the equation.

If you multiply each side of the equation by  $10x$ , it becomes

$$2x = 950$$

Then you can just divide by 2 to get

$$x = 950/2$$

Simplify this expression to find your answer.

Don't forget that, since the units are rooms, you need to round your answer!

- $950/2 = 475$

The hotel has 475 rooms.

---

**12) Assignment #230843 "230843 - Solving for an Unknown in a Proportion"**

Find the value of  $a$  that makes the fraction equivalent.

$$\frac{a}{16} = \frac{3}{5}$$

If necessary, round your answer to the nearest tenth.

Algebra:

✓ 9.6

Hints:

- This is how to solve a problem similar to your problem.

$$\frac{a}{12} = \frac{2}{15}$$

$$15a = 12 \times 2$$
$$15a = 24$$

$$a = 24/15$$

$$a = 1.6$$

- The first step to solve a proportion problem like this is to cross multiply.

$$\frac{a}{16} = \frac{3}{5}$$

$$5a = 16 \times 3$$
$$5a = 48$$

- The last step to solve is to divide both sides of the equation by 5.

$$\frac{5a}{5} = \frac{48}{5}$$

$$a = 9.6$$

Round 9.6 to 9.6. Type in 9.6

---

13) Assignment #230850 "230850 - Setting Up Proportions"

When making tea, you use 5 spoons of sugar for every 14 quarts of tea. Which of the following equations

can be used to calculate  $c$ , the number of spoons of sugar needed when using 34 quarts of tea?

A.  $\frac{34}{14} = \frac{5}{c}$

B.  $\frac{34}{5} = \frac{c}{14}$

C.  $\frac{14}{5} = \frac{c}{34}$

D.  $\frac{5}{14} = \frac{c}{34}$

Multiple choice:

☒ A

☒ B

☒ C

☒ D

Hints:

- The problem is about the following ratio

number of spoons of sugar : number of quarts of tea

- Line up the labels that are on the top and bottom of the fractions.

spoons of sugar on the top

quarts of tea on the bottom

- We know that 5 spoons of sugar is needed for every 14 quarts of tea used. This means that

5 : 14

or

5 spoons of sugar

14 quarts of tea

- We also know that  $c$  spoons of sugar is needed for every 34 quarts of tea used. This means that

$$c : 34$$

or

$$\frac{c \text{ spoons of sugar}}{34 \text{ quarts of tea}}$$

- The labels on the two equations from the previous two hints are lined up on the top and bottom.

This means that the proportions are equal to each other. Therefore,

$$\frac{5}{14} = \frac{c}{34}$$

This is an equation that can be used to find  $c$ , the number of spoons of sugar needed for 34 quarts of tea. So the answer is D. Select D.

#### 14) Assistent #230857 "230857 - Solving for an Unknown in a Proportion"

Find the value of  $a$  that makes the fraction equivalent.

$$\frac{a}{28} = \frac{10}{7}$$

Algebra:

✓ 40

Hints:

- 

$$\frac{a-?}{28 \div ?} = \frac{10}{7}$$

$$28 \div ? = 7$$

- $28 \div ? = 7$

$$28 \div 7 = ?$$

$$? = 4$$

- $a \div 4 = 10$

$$a = 10 * 4$$

$$a = 40$$

Type 40.

**15) Assisment#230864 "230864 - Setting Up Proportions"**

When doing the laundry, you use 12 cups of detergent for every 6 gallons of water. Which of the following equations can be used to calculate c, the number of cups of detergent needed for 25 gallons of water?

**Multiple choice:**

☒  $12/6 = c/25$

☐  $12/6 = 25/c$

☐  $12/25 = 6/c$

☐  $25/6 = 12/c$

**Hints:**

- The problem is about the following ratio

number of cups of detergent : number of gallons of water

- This ratio means that

cups of detergent on the top

gallons of water on the bottom

- We know that 12 cups of detergent is needed for every 6 gallons of water used. This means that

12 : 6

or

12 cups of detergent

6 gallons of water



- We also know that  $c$  cups of detergent is needed for every 25 gallons of water used. This means that

$$c : 25$$

or

$c$  cups of detergent

25 gallons of water

- Notice labels on the two equations from the previous two hints are lined up on the top and bottom.

This means that the proportions are equal to each other. Therefore,

$$\frac{12}{6} = \frac{c}{25}$$

This is an equation that can be used to find  $c$ , the number of cups of detergent needed for 25 gallons of water.

So the answer is  $12/6 = c/25$ .

#### 16) Assignment #230871 "230871 - Write the ratio 1 ..."

Write the ratio 17 to 20 in simplest form.

Express your answer in ratio form.

Example:

1:2

with no spaces:

Fill in:

✓ 17:20

✓ 17 : 20

✓ 17:20

✓ 17 :20

Hints:

- One way to represent this ratio 17 to 20, is as a fraction

$$\frac{17}{20}$$

First let's try to find the greatest common factor to simplify the ratio.

•

Now let's reduce the fraction to lowest terms.

The greatest common factor between 17 and 20 is 1.

Since the greatest common factor equals 1, no additional division is needed.

$\frac{17}{20}$  is the simplified form.

- Now rewrite the ratio in the colon notation. Note 17:20 is simplified as 17:20.

Type in 17:20 and click submit.

---

**17) Assignment #230881 "230881 - Unit rates - Find the rate"**

A store is having a sale on candy bars. Customers can get 40 candy bars for \$5.

How many candy bars can you get for a dollar at this store?

**Fill in:**

✓ 8

**Hints:**

- This is a unit rate problem.

You're trying to find the candy bar/dollar rate at the store.

Use the given information to determine the rate.

•

$$\frac{40 \text{ candy bars}}{5 \text{ dollars}} = \frac{40 \text{ candy bars} \div 5}{5 \text{ dollars} \div 5} = \frac{8 \text{ candy bars}}{1 \text{ dollar}}$$

- $40/5 = 8/1$

A dollar at this store can get you 8 candy bars.

---

**18) Assignment #230888 "230888 - Unit rates - Enter best price rate"**

Stacey is buying her first car. She's trying to compare the gas mileage of her three top choices.

The first car can travel 352 miles on 8 gallons of gas.

The second can travel 405 miles on 15 gallons.

The third can travel 320 miles with 10 gallons of gas.

How many miles per gallon does the most efficient of the three cars get?

**Fill in:**

✓ 44

- ✓ 44 miles/gallon
- ✓ 44 miles per gallon

**Hints:**

- This problem asks you to compare the rates of miles/gallon of several cars.

Before you can compare these rates, you need to find them.

- To find how many miles each car gets per gallon, you need to divide its miles by its gallons.

Your answer is whichever of the following has the greatest value:

352 miles/8 gallons

405 miles/15 gallons

320 miles/10 gallons

- $352/8 = 44$  miles/gallon

$405/15 = 27$  miles/gallon

$320/10 = 32$  miles/gallon

Of these, the greatest is 44 miles/gallon.

Type in 44.

---

## Conversion of Fractions, Decimals, and Percents

### Problem Set "Conversion of Fractions, Decimals, and Percents" id:[43469]

#### 1) Assignment #226431 '226431 - Converting Decimals to Simplified Fraction - thousandths place only'

Convert 0.001 into a **simplified fraction**.

Fill in:

✓ 1/1000

✓ 1 / 1000

Hints:

- In order to convert a **decimal** into a **simplified fraction**, you should first identify the place value of the last number in the decimal 0.001.

In this case it is three places right of the decimal, in the thousandths place.

Therefore you should multiply the **decimal** by  $\frac{1000}{1000}$  and then simplify it if possible.

•

$$\frac{0.001 \times 1000}{1 \times 1000} = \frac{1}{1000}$$

You can simplify the fraction by finding the **greatest common factor** and divide both the **numerator** and **denominator** by it.

- The greatest common factor is 1.

Since the **greatest common factor** equals 1, no additional division is needed.

$\frac{1}{1000}$  is the simplified fraction form of 0.001.

The answer is 1 / 1000, enter 1 / 1000.

#### 2) Assignment #226435 '226435 - Converting a fraction to a nonterminating or terminating decimal.'

A container is  $\frac{7}{9}$  full with water.

Use a decimal to express the same amount of capacity.

Round to the thousandth place if needed.

Fill in:

✓ 0.778

✓ .778

✓ .778

✓ 0.778

Hints:

•

The decimal value of  $\frac{7}{9}$  is numerator divided by the denominator.

If you do not recognize the value immediately, you will have to perform the division manually.

To the right of the numerator, insert a decimal point and enough zeros to get to one more digit than you need in your final answer.

Round your final answer to the required number of digits.

You should end up with something like this:

$$\begin{array}{r} \text{---} \\ 9 \overline{) 7.0000} \end{array}$$

•

$\frac{7}{9} = 0.778$  (after rounding, if needed)

The answer is 0.778, enter 0.778.

---

3) Assignment #226439 '226439 - Fraction Conversion- Frac -> Perc - w/bench'

Convert  $\frac{2}{3}$  into a percent.

Round your answer to the nearest percent.

ASSISTments does not read units, so type in just the number part. Example: if the answer is 28%, type in 28.

Fill in:

ANSWER

✓ 67

✗ 67%

- Remember ASSISTments does not take the percent sign

✗ 67 %

- Remember ASSISTments does not take the percent sign

Hints:

•

Remember,  $\frac{2}{3}$  means **two-thirds**.

- **Percent** is out of a hundred. This means that the **percent** form is **two-thirds** out of a hundred.
- So **two-thirds** out of a hundred is **67%**. Type in 67.

---

#### 4) Assignment #226444 '226444 - Converting a Fraction to a Percent'

Convert  $\frac{6}{10}$  into a **percent**.

Round your answer to the nearest percent.

ASSISTments does not read units, so type in just the number part. Example: if the answer is 28%, type in 28

Fill in:

✓ 60

✓ 60 %

✓ 60%

Hints:

•

To convert a **fraction** to a **percent** you need to divide the **numerator** by the **denominator** and then convert the **decimal** to a **percent**.

- For this problem you need to find  $6 \div 10$ . Carry out your division to three decimal places then round to 2 decimal places.

Next you have convert it into a **percent**.

- **Rounded to two decimal places,  $6 \div 10 = 0.60$**

- To convert a **decimal** to a **percent** you must multiply the **decimal** by 100. To do this move the **decimal** to the right two places and add the percent sign.

TO DO THIS ABOVE THE **NUMERATOR** IN THE FRACTION BAR, AND OVER THE **DENOMINATOR**.

$6 \div 10$  is about **0.60**

**0.60** is equal to **60%**. Type in 60.

---

5) Assignment #226454 '226454 - 201724 - Converting a fraction to a terminating decimal.'

Change the fraction to the equivalent decimal:  $\frac{3}{5}$

Fill in:

✓ 0.6

✓ .6

Hints:

- To find the equivalent decimal, divide the **numerator** by the **denominator**.

•

$\frac{3}{5}$

$$= 3 \div 5 = 0.6$$

$\frac{3}{5}$

The answer is 0.6. Type in 0.6.

---

6) Assignment #226458 '226458 - 202912 - Converting a fraction to a nonterminating or terminating decimal.'

Change the fraction to the equivalent decimal:  $\frac{3}{8}$

**Round to the thousandth place if needed.**

Fill in:

✓ 0.375

✓ .375

✓ .375

✓ 0.375

Hints:

•

$$\frac{3}{8}$$

The decimal value of  $\frac{3}{8}$  is numerator divided by the denominator.





Multiply 0.90 by  $\frac{100}{100}$  simplify the fraction if possible.

•

$$\frac{0.90 \times 100}{1 \times 100} = \frac{90}{100}$$

Now you should simplify the fraction and attach it to 37.

•

$\frac{9}{10}$  is the **simplified fraction** form of 0.9.

$\frac{9}{10}$  attached to 37 is  $37\frac{9}{10}$

The answer is 37.9 / 10, enter 37.9 / 10.

8) Assignment #226466 - 223064 - 194983 - Converting decimal to Simplified Fraction - down to hundredths place

If 0.05 of a bag of candy is cherry flavored, how would that amount be expressed as a **simplified fraction**?

Fill in:

✓ 1/20

✓ 1 / 20

✗ 5 / 100

• Don't forget to simplify your fraction!

✗ 5/100

• Don't forget to simplify your fraction!

**Hints:**

• In order to convert a **decimal** into a **simplified fraction**, you should first count the number of digits to the right of the decimal. 0.05.

There are two places to the right of the decimal.

Multiply **decimal** by  $\frac{100}{100}$  (100 has 2 zeros) and then simplify if possible.

$$\frac{0.05 \times 100}{1 \times 100} = \frac{5}{100}$$

You can simplify the fraction by finding the **greatest common factor** and divide both the **numerator** and **denominator** by it.

- The greatest common factor is 5.

$$5 \div 5 = 1 \text{ and } 100 \div 5 = 20$$

$$\frac{1}{20} \text{ is the simplified fraction form of } 0.05.$$

The answer is 1 / 20, enter 1 / 20.

#### 9) Assistent #226470 "226470 - Converting a Decimal to a Percent"

Convert **0.75** into a **percent**.

Fill in:

- ✓ 75
- ✓ 75%
- ✓ 75 %

Hints:

- The easiest way to convert a **decimal** into a **percent** is to *multiply the decimal by 100*. This simply means **moving the decimal two places to the right**.

$$0.75 \times 100 = 75$$

The **percent** form of **0.75** is **75%**, so type in 75.

#### 10) Assistent #226505 "226505 - Converting Decimals to Simplified Mixed Number"

A industrial recipe for cupcakes calls for **25.61** cups of flour, how would you represent the same number of cups as a **simplified mixed number**?

Don't forget to separate the integer and fraction parts with a space!

Fill in:

✓ 25 61/100

✓ 25 61 / 100

Hints:

- We need to show the whole number part next to the **simplified fraction** that represents 0.61.

Notice that 0.61's last decimal place is **two places** right of the decimal point (**in the hundredths place**), which means multiplying it by **100** will yield us a whole number.

Multiply 0.61 by  $\frac{100}{100}$  simplify the fraction if possible.

$$\frac{0.61 \times 100}{1 \times 100} = \frac{61}{100}$$

Now you should simplify the fraction and attach it to 25.

•  $\frac{61}{100}$  is the **simplified fraction** form of 0.61.

$\frac{61}{100}$  attached to 25 is  $25 \frac{61}{100}$

The answer is 25 61 / 100, enter 25 61 / 100.

---

11) Assignment #226509 "226509 - Converting a mixed number to a terminating decimal."

A very large party sub spanned  $94 \frac{1}{8}$  meters.

8

Express the same amount of meters with a decimal number.

Fill in:

✓ 94.125

✗  $(94 * 100 + 1) / 8$

- The integer value on the left is not part of the numerator.

Hints:

•

94 is a whole number and  $\frac{1}{8}$  is a fraction.

The decimal value is the sum of both the right and left.

•

We need to find out the decimal value of  $\frac{1}{8}$  and add it to 94

We can do so by dividing the numerator by the denominator.

- The value of  $1 \div 8$  is 0.125.

$$94 \frac{1}{8} = 94 + 0.125 = 94.125$$

The answer is 94.125. Type in 94.125.

---

#### 12) Assignment #226514 "226514 - Converting a Percent to a Decimal"

Convert 76% into a decimal.

Fill in:

✓ 0.76

✓ .76

Hints:

•

The easiest way to convert a percent into a decimal is to *divide the percent by 100*. This simply means **moving the decimal two places to the left**.

•

$$76 \div 100 = 0.76$$

The decimal form of 76% is 0.76 so type in 0.76

the simplified form of  $0.70$  is  $0.70$ , so type in  $0.70$ .

---

13) Assignment #226529 "226529 - 194983 - Converting Decimals to Simplified Fraction- down to hundredths place"

Convert  $0.42$  into a simplified fraction.

Fill in:

✓  $21/50$

✓  $21 / 50$

✗  $42 / 100$

- Don't forget to simplify your fraction!

✗  $42/100$

- Don't forget to simplify your fraction!

Hints:

- In order to convert a decimal into a simplified fraction, you should first identify the place value of the last number in the decimal  $0.42$ .

In this case it is two places right of the decimal, in the hundredths this place.

Therefore you should multiply the decimal by  $\frac{100}{100}$  and then simplify it if possible.

•

$$\frac{0.42 \times 100}{1 \times 100} = \frac{42}{100}$$

You can simplify the fraction by finding the greatest common factor and divide both the numerator and denominator by it.

- The greatest common factor is 2.

$$42 \div 2 = 21 \text{ and } 100 \div 2 = 50$$

$\frac{21}{50}$  is the simplified fraction form of  $0.42$ .

The answer is  $21 / 50$ , enter  $21 / 50$ .

---

14) Assignment #226534 "226534 - 201726 - Converting a fraction to a nonterminating decimal"

Change the fraction to the equivalent decimal:  $\frac{4}{6}$

Round to the thousandth place if needed.

Fill in:

✓ 0.667

✓ .667

Hints:

•

The decimal value of  $\frac{4}{6}$  is numerator divided by the denominator.

To the right of the numerator, insert a decimal point and enough zeros to get to one more digit than you need in your final answer.

Round your final answer to the required number of digits.

You should end up with something like this:

$$\begin{array}{r} \text{---} \\ 6 \overline{) 4.0000} \end{array}$$

•

$$\frac{4}{6} \approx 0.6666 \approx 0.667 \text{ after rounding.}$$

The answer is 0.667, enter 0.667.

---

15) Assignment #226538 "226538 - Converting Percents to Decimals"

Convert 86.57% into a decimal.

Fill in:

✓ 0.8657

✓ .8657

**Hints:**

- The easiest way to convert a **percent** into a **decimal** is to *divide the percent by 100*. This simply means **moving the decimal two places to the left**.

- $86.57 \div 100 = 0.8657$

The **decimal** form of **86.57%** is **0.8657**, so type in 0.8657.

---

16) Assignment #226553 "226553 - 194978 - Converting a mixed number to a terminating decimal."

What is  $93 \frac{11}{40}$  as a decimal number?

**Fill in:**

✓ 93.275

✗  $(93 * 100 + 11) / 40$

- The integer value on the left is not part of the numerator.

**Hints:**

- 

93 is a whole number and  $\frac{11}{40}$  is a fraction.

The decimal value is the sum of both the right and left.

- 

We need to find out the decimal value of  $\frac{11}{40}$  and add it to 93

We can do so by dividing the **numerator** by the **denominator**.

- The value of  $11 \div 40$  is 0.275.

$$93 \frac{11}{40} = 93 + 0.275 = 93.275$$

The answer is 93.275. Type in 93.275.

---

17) Assignment #226557 "226557 - Converting a fraction to a terminating decimal."

$\frac{3}{4}$

A  $\frac{3}{10}$  foot section of wood was trimmed from a piece of lumber.

Express this length as a decimal.

Fill in:

✓ 0.3

✓ .3

Hints:

- To find the equivalent decimal, divide the numerator by the denominator.

•

3

$$\frac{3}{10} = 3 \div 10 = 0.3$$

10

The answer is 0.3. Type in 0.3.

---

18) Assignment #226562 "226562 - Fraction Conversion - Fractions to Percents"

Convert  $\frac{3}{4}$  into a percent.

(round to the nearest percent)

Fill in:

✓ 75

✓ 75%

✓ 75 %

Hints:

•

Remember,  $\frac{3}{4}$  means three-fourths.

- Percent is out of a hundred. This means that the percent form is three-fourths out of a hundred.
- So three-fourths out of a hundred is 75%. Type in 75.

---

19) Assignment #226572 "226572 - Converting Percents to Fractions"

Convert 60% into a fraction in lowest terms.

Fill in:

✓ 3/5

✓ 3/5



✓ 3 / 5

✓ 3/5

✓ 3/5

✓ 3/5

✓ 3/5

**Hints:**

- Remember, **60%** means **60 out of 100**.
- 

And **60 out of 100** is equal to  $\frac{60}{100}$  which reduces to  $\frac{3}{5}$ .

So, the **fraction** form of **60%** is  $\frac{3}{5}$ , type in 3/5.

---

20) Assignment #226602 - 226602 - 201722 - Converting Decimals to Simplified Fraction- down to thousandths place'

Convert **0.274** into a **simplified fraction**.

**Fill in:**

✓ 137/500

✓ 137 / 500

✗ 274 / 1000

- Don't forget to simplify your fraction!

✗ 274/1000

- Don't forget to simplify your fraction!

**Hints:**

- In order to convert a **decimal** into a **simplified fraction**, you should first identify the place value of the last number in the decimal **0.274**.

In this case it is three places right of the decimal, in the thousandths place.

Therefore you should multiply the **decimal** by  $\frac{1000}{1000}$  and then simplify it if possible.

•

$$\frac{0.274 \times 1000}{1 \times 1000} = \frac{274}{1000}$$

You can simplify the fraction by finding the **greatest common factor** and divide both the **numerator** and **denominator** by it.

- The greatest common factor is 2.

$$274 \div 2 = 137 \text{ and } 1000 \div 2 = 500$$

$$\frac{137}{500} \text{ is the simplified fraction form of } 0.274.$$

The answer is 137 / 500 , enter 137 / 500 .

21) Assignment #226606 "226606 - 194985 - Converting a mixed number to a nonterminating decimal."

What is  $2\frac{5}{7}$  as a decimal number?

**Round to the thousandth place if needed.**

**Algebra:**

✓ 2.714

✗ 2.71428571428571

- Don't forget to round!

**Hints:**

•

2 is a decimal number and  $\frac{5}{7}$  is a fraction.

The decimal value is the sum of the decimal values of both the right and left.

•

We need to find the decimal value of  $\frac{5}{7}$  and add it to 2.

7

We get the decimal value of the fraction by dividing the numerator by the denominator and then rounding the result to the thousandths place.

- The value of  $5 \div 7$  is 0.7142...

After rounding, we get 0.714.

$$2 \frac{5}{7} = 2 + 0.714 = 2.714$$

The answer is 2.714, enter 2.714.

---

## Exponent, Square Roots

### Problem Set "Exponent, Square Roots" id:41472

#### 1) Assisment #228941 "228941 - 47130 - Estimating Square Roots"

The value of  $\sqrt{84}$  is between which two whole numbers?

Multiple choice:

- ☒ 9 and 10
- ☐ 10 and 11
- ☐ 8 and 9
- ☐ 7 and 8

Hints:

- This [how to solve a problem](#) similar to your problem.

$\sqrt{150}$  is between which two whole numbers?

$$\sqrt{144} = 12$$

$$\sqrt{150} =$$

$$\sqrt{169} = 13$$

$\sqrt{150}$  is between 12 and 13

- You need to know which two perfect squares 84 is between to solve.  
A **perfect square** is the answer to a number multiplied by itself.
- 84 is between which of the following numbers on the **perfect square** list?

Number	Perfect Squares
$1^2$	1
$2^2$	4
$3^2$	9
$4^2$	16
$5^2$	25
$6^2$	36
$7^2$	49
$8^2$	64
$9^2$	81
$10^2$	100

47130 228941 41472

$\sqrt{84}$  is between 9 and 10

---

2) Assignment #228991 "Exponents - Positive"

What is the standard form of the following number?

$$11^3$$

Algebra:

✓ 1331

Hints:

- 

11 is the base, and 3 is the exponent.

$$11^3$$

Right now, 11 is being raised to the power of 3.

- 

To find the standard form of  $11^3$ , we

have to multiply the base, which is 11, by itself 3 times.

- Use the Table of Exponents to find the standard form of  $11^3$ .

Table of Exponents				
$11^0$	=	1	=	1
$11^1$	=	11	=	11

$11^2$	=	$11 * 11$	=	121
$11^3$	=	$11 * 11 * 11$	=	1331
$11^4$	=	$11 * 11 * 11 * 11$	=	14641
$11^5$	=	$11 * 11 * 11 * 11 * 11$	=	161051

Using the row with the exponent of 3, we get the

standard form of  $11^3$  to be 1331. Type in 1331.

---

**3) Assignment #229016 "229016 - 128554 - Meaning of exponentiation (Template)"**

How would you evaluate this expression?

$$19^4$$

**Multiple choice:**

- ☒ I would multiply 19 by 4.
- ☒ I would add 19 to itself 4 times.
- ☒ I would multiply 4 by 19.
- ☒ I would multiply 19 by itself 4 times.
- ☒ I would type 19 into my calculator and then hit the  $x^4$  button

- There is no  $x^4$  button on your calculator.

**Hints:**

- The exponent means to multiply by itself that many times.
  - The answer is: I would multiply 19 by itself 4 times.
-

4) Assignment #229041 "229041 - Exponents - Positive"

What is the standard form of the following number?

$$6^2$$

Fill in:

✓ 36

Hints:

- 

6 is the base, and 2 is the exponent.

$$6^2$$

Right now, 6 is being raised to the power of 2.

- 

To find the standard form of  $6^2$ , we

have to multiply the base, which is 6, by itself 2 times.

- Use the Table of Exponents to find the standard form of  $6^2$ .

Table of Exponents				
$6^0$	=	1	=	1
$6^1$	=	6	=	6
$6^2$	=	$6 * 6$	=	36

$6^3$	=	$6 * 6 * 6$	=	216
$6^4$	=	$6 * 6 * 6 * 6$	=	1296
$6^5$	=	$6 * 6 * 6 * 6 * 6$	=	7776

Using the row with the exponent of 2, we get the

standard form of  $6^2$  to be 36. Type in 36.

---

5) Assisment #229066 "229066 - Square Roots"

What is the value of  $\sqrt{49}$ ?

Algebra:

✓ 7

Hints:

- $49$  is a **perfect square**.  
This means that  $49$  is the *answer to a number multiplied by itself*.
- Use the following **perfect square** table to find the value of  $\sqrt{49}$ :

Number	Squared
$1^2$	1
$2^2$	4
$3^2$	9
$4^2$	16
$5^2$	25
$6^2$	36
$7^2$	49



$8^2$	64
$9^2$	81
$10^2$	100

The table shows that the square root of 49 is 7.

So type in 7

- The table shows that the square root of 49 is 7.

So type in 7.

---

6) Assignment #229116 "229116 - Exponents - Positive"

What is the standard form of the following number?

$$1^2$$

Algebra:

✓ 1

Hints:

- 1 is the base, and 2 is the exponent.

$$1^2$$

Right now, 1 is being raised to the power of 2.

- 

To find the standard form of  $1^2$ , we

have to multiply the base, which is 1, by itself 2 times.

- Use the Table of Exponents to find the standard form of  $1^2$ .

Table of Exponents				
$1^0$	=	1	=	1
$1^1$	=	1	=	1
$1^2$	=	$1 * 1$	=	1
$1^3$	=	$1 * 1 * 1$	=	1
$1^4$	=	$1 * 1 * 1 * 1$	=	1
$1^5$	=	$1 * 1 * 1 * 1 * 1$	=	1

Using the row with the exponent of 2, we get the

standard form of  $1^2$  to be 1. Type in 1.

---

## Word Problems

### Problem Set "Word Problems" id: [41474]

#### 1) Assisment #237564 '237564 - 221429 - mika logic word problem'

Tony, George, Sam, and Phil each bought a car. Tony's car has fewer miles than Sam's. Phil's car has less miles than Sam but more miles than Tony's. If Phil's has less miles than George then whose car has more miles, Tony, Sam, Phil or George?

#### Multiple choice:

- ☒ not enough information given
- ☐ Tony
- ☐ George
- ☐ Phil
- ☐ Sam

#### Hints:

- Lets start by stating all the relations each person has with each other. Then order all of the signs to face the same direction

Tony < Sam  
Phil < Sam  
Tony < Phil  
Phil < George

- Next lets try to connect some of the relations to minimize the amount of relations based off of the information given

Tony < Sam

Tony < Phil < George

- In order to tell who has the most miles we should connect all the information given

Tony < Phil < George

However since there is no relation between George and Sam we do not have enough information to determine the answer.

Check "not enough information given" and click submit.

---

#### 2) Assisment #237580 '237580 - mean with whole numbers - hundreds'

A charity is performing a fund raising campaign, below are the amounts of money raised each week:

\$4954, \$4162, \$5476, \$15016, \$7670, \$11358

Calculate the **mean** dollar amount of money raised per week (round to nearest dollar).

**Fill in:**

- ✓ 8106
- ✓ \$8106
- ✓ \$ 8106

**Hints:**

- To find the **mean**, you have to find the **sum** of the money raised divided by the number of weeks.

- $4954 + 4162 + 5476 + 15016 + 7670 + 11358 = 48636$

$48636$  was raised.

The fundraiser spanned 6 weeks.

- $48636 \div 6 = 8106$

8106 is the mean number of dollars raised per week.

Enter 8106 and submit.

---

**3) Assignment #237595 - Mika Word Problems Arithmetic subtraction'**

Stacy, George and Matthew each collected donations for Relay for Life. Stacy collected \$29.8, George collected \$44 and Matthew collected \$21.01. What is the difference between the total amount collected and the smallest amount collected?

Round to the nearest whole number. Please enter your answer without the \$ sign.

**Fill in:**

- ✓ 74

**Hints:**

- Let's start by determining the total amount collected by the students.

$$29.8 + 44 + 21.01 = 94.81$$

- Remember the word "difference" means subtraction.

So the difference between the total amount collected and the smallest amount is:

$$94.81 - 21.01 = 73.8$$

$$74.51 - 0.01 = 74.5$$

- Don't forget to round to the nearest dollar.

\$73.8 rounded to the nearest dollar is \$74. Type 74 and click submit.

4) Assignment #237610 '237610 - 217807 - Mila - wordproblem arithmetic ''

Stewart played a game of table tennis for 16 minutes on Monday and 38 minutes on Friday. What is the average amount of time he played table tennis?

Round to the nearest whole number.

Fill in:

✓ 27

Hints:

- Remember the average is adding the numbers in the data set and dividing by the amount of numbers in the data set.
- Lets try determining the total amount of minutes playing table tennis.

$$16 \text{ minutes} + 38 \text{ minutes} = 54 \text{ minutes}$$

- The average in this example is adding all the minutes and dividing this total by the number of days playing table tennis.

$$\frac{54}{2} = 27$$

So the answer is 27. Type in 27 and submit.

5) Assignment #237625 '237625 - meanwith whole numbers - tens''

Below are the number of texts Allison sent and received each month over the past few months.

96, 64, 21, 4, 88, 33, 87, 40, 26

What's the **mean** texts per month for Allison?

Fill in:

✓ 51

Hints:

- To find the **mean** texts per month, you have to find the number of **all texts** and divide it by the number of months.

$$96 + 64 + 21 + 4 + 88 + 33 + 7 + 40 + 26 = 459$$

There were 459 texts.

There are 9 months in the set.

$$\bullet 459 \div 9 = 51$$

51 is the mean texts per month.

Enter 51 and submit.

---

**6) Assisment #237640 '237640 - 222202 - mila - chili word problems'**

Tim, April and Jasmine got together to make pizza for dinner. Tim ate 1% of the pizza, April ate 10% and Jasmine ate 15%. A fourth friend, Malcolm, came over after practice. What percent of the pizza was left for Malcolm?

Please have them enter the number as a percent without the % sign.  
So if the answer is 15%, "enter 15"

**Fill in:**

✓ 74

**Hints:**

- Lets start by determining what percentage of the pizza was consumed before Malcolm arrived.

$$\text{Tim } 1\% + \text{April } 10\% + \text{Jasmine } 15\% = 26\%$$

- Next lets determine what percent of the pizza was left for Malcolm.

$$100\% - 26\% = 74\%$$

So the amount left for Malcolm was 74%. Type 74 and click submit

---

**7) Assisment #237655 '237655 - mean with whole numbers - ones'**

A survey was done on weekly cookie consumption on a small group of students, below are the responses (in cookies eaten in the last week).

4, 4, 1, 0, 1, 6, 0, 16

What is the mean number of cookies eaten per week for the students?

**Fill in:**

✓ 4

**Hints:**

- To find the **mean** number of cookies, you have to find the **sum** of all cookies consumed divided by the number of students.

- The students ate  $4 + 4 + 1 + 0 + 1 + 6 + 0 + 16 = 32$  cookies.

8 students were in the survey.

- $32 \div 8 = 4$  cookies

4 is the **mean** number of cookies consumed.

Enter 4 and submit.

---

8) Assignment #237670 "237670 - mika word problems arithmetic"

The admission tickets to an art show were priced at \$13 for an adult and \$11 for a child. A group of 9 adults and 10 children visited the art show. What would be the change if a \$300 check was used to buy the tickets?

Please enter your answer without the \$ sign.

**Fill in:**

✓ 73

**Hints:**

- Let's start by determining the total cost for adults.

There were 9 adults and each adult ticket cost \$13.

So,  $9 \text{ adults} * \$13 = \$117$

- Next, let's determine the total cost of children and adults to travel.

There were 10 children and each child ticket cost \$11.

$10 \text{ children} * \$11 = \$110$

So,  $\$117 + \$110 = \$227$

- The total cost for a group to visit the art show is \$227.

It was paid for by a \$300 check.

The change would be the difference between the total cost for tickets and the amount that was paid.

So,  $\$300 - \$227 = \$73$  Type in 73 and click submit.

---

9) Assignment #237685 "237685 - Mika Word Problem Area"

Cory realizes that his hard wood floors are getting old. Now he wants to replace it with carpet. What will

it cost to carpet a rectangular room with length 31 ft and width 4 ft? The carpet is \$21.71 per square foot.

Round to nearest dollar.

**Fill in:**

✓ 2692

**Hints:**

- First lets try to determine the total amount of square feet Cory needs.

$$31 \text{ ft} * 4 \text{ ft} = 124 \text{ ft}$$

So the total amount of square feet necessary is 124 ft.

- Next, lets determine the total cost to carpet Cory's floor.

$$124 \text{ ft} * \$21.71 \text{ is } \$2692.04$$

Remember the word "per" means to multiply.

- Don't forget to round to the nearest dollar.

\$2692.04 rounded to the nearest dollar is \$2692

Type 2692 and click submit.

---

**10) Assignment #237700 "237700 - mean with whole numbers - hundreds"**

Below are the number of spam emails filtered each week over the past few weeks by a school email system:

1004, 450, 499, 487, 114, 536

What is the **mean** number of spam emails filtered per week?

**Fill in:**

✓ 515

**Hints:**

- For find the **mean** number of spam emails filtered per week, you have to find the **sum** of all the **spam emails** filtered divided by the number of weeks.

- $1004 + 450 + 499 + 487 + 114 + 536 = 3090$

3090 spam emails were filtered.

There are 6 weeks in the set.



- $3090 \div 6 = 515$

515 is the mean number of spam emails filtered per week.

Enter 515 and submit.

**11) Assignment #237732 "237732 - 216567 - Mika-Word Problems Whole Numbers"**

Kelly bought 14 boxes of toys. Each box had 26 toys in it. She kept 5 toys for herself and 6 toys for her brother. She gave the rest to 10 friends. Each friend received the same number of toys. How many toys did each friend receive?

Round to the nearest whole number.

**Fill in:**

✓ 35

**Hints:**

- Lets start by determining the total amount of toys there are.

$$14 \text{ boxes} * 26 \text{ toys} = 364$$

Remember each means multiply.

- Next lets determine the total amount of toys Kelly decided to keep for herself and her brother.

$$5 + 6 = 11$$

So total, Kelly had 364 toys and kept 11 toys for herself and her brother.

- Now lets determine how many toys Kelly had left, before each friend receive their portion of toys.

Total, Kelly had 364 toys and kept 11 toys for herself and her brother.

$$364 \text{ toys} - 11 \text{ toys} = 353 \text{ toys}$$

- We know Kelly had 353 toys left for each of his 10 friends.

So divide the amount of toys left for each friend by the number of friends Kelly has.

$$\frac{353}{10} = 35$$

The answer is 35 toys. Type in 35 and click submit.

**12) Assignment #237747 "237747 - Milka logic word problem"**

Joe, Charles, Sean, and Ryan each bought a car. Joe's car has fewer miles than Sean's and Sean's car has more miles than Charles. Ryan's car has less miles than Sean but more miles than Joe's. If Ryan's has less miles than Charles then whose car has more miles, Joe, Sean, Ryan or Charles?

**Multiple choice:**

- ☒ Sean
- ☐ Joe
- ☐ Charles
- ☐ Ryan
- ☐ not enough information given

**Hints:**

- Let's start by stating all the relations each person has with each other. Then order all of the signs to face the same direction.

Joe < Sean  
Charles < Sean

Ryan < Sean  
Joe < Ryan  
Ryan < Charles

- Next let's try to connect some of the relations to minimize the amount of relations based off of the information given.

Joe < Sean  
Charles < Sean  
Joe < Ryan < Charles

- In order to tell who has the most miles we should connect all the information given.

Joe < Ryan < Charles < Sean

So Sean is the correct answer. Check Sean and click submit.

---

**13) Assignment #255227 "255227 - Milka word problem dips"**

Brittany knows that for his upcoming meeting, she should bring snacks in order to make a good impression on her boss. Brittany brought 38 small boxes of oreos for the meeting. 13 boxes were eaten during the meeting. What fraction of oreos was not eaten during the meeting?

**Represent your answer in fractions.**

For example:  $\frac{1}{2}$  will be answered as 1/2

Fill in:

✓ 25/38

Hints:

- Lets start by determining how many boxes of oreos were not eaten in during the meeting.

$$38 \text{ oreos} - 13 \text{ oreos} = 25 \text{ oreos}$$

- One way to represent this ratio 25 to 38, is as a fraction.

$$\frac{25 \text{ oreos}}{38 \text{ oreos}}$$

First lets try to find the greatest common factor to simplify the ratio.

•

Now lets reduce the fraction to lowest terms.

The greatest common factor between 38 and 25 is 1.

Since the greatest common factor equals 1, no additional division is needed.

25 oreos 38 oreos is the simplified form.

Type in 25/38 and click submit.

## Rounding

### Problem Set "Rounding" id:41475

#### 1) Assignment #235245 "235245 - Round to the Ten-Millions Place"

Round the following number to the **ten-millions place**

535543427

Fill in:

✓ 540000000

Hints:

- 535,543,427

Remember, the **ones place** digit is the right-most digit.

And, the **ten place** digit is the second-right-most digit.

And, the **hundreds place** digit is the third-right-most digit.

And, the **thousands place** digit is the fourth-right-most digit.

And, the **ten-thousands place** digit is the fifth-right-most digit.

And, the **hundred-thousands place** digit is the sixth-right-most digit.

And, the **millions place** digit is the seventh-right-most digit.

Lastly, the **ten-millions place** digit is the eighth-right-most digit.

- The digit in the **millions place** of 535543427 is 5.

If the digit in the **ten place** is 5 or greater, round up otherwise truncate.

- 535543427 rounded to the **ten-millions place** is 540000000.

So type in 540000000.

---

#### 2) Assignment #235276 "235276 - Round to the Ten-Thousands Place"

Round the following number to the **ten-thousands place**

66352

Fill in:

✓ 70000

Hints:

- 66352

Remember, the **ones place** digit is the right-most digit.

The **ten place** digit is the second-right-most digit.

And, the **hundreds place** digit is the third-right-most digit.

Lastly, the **thousands place** digit is the fourth-right-most digit.

And, the **ten-thousands** place digit is the third-right-most digit.

- The digit in the **thousands place** of 66352 is 6.

If the digit in the thousands place is 5 or greater, round up otherwise truncate.

- 66352 rounded to the tens place is 70000.

So type in 70000.

---

3) Assignment #235306 "235306 - Rounding - Hundredths Place"

Round the following number to the **hundredths place**.

5.422

Algebra:

✓ 5.42

Hints:

- Since we are rounding to the **hundredths place**, we have to use the digit on the **thousandths place**.

- 5.422

Remember, the **ones place** digit is the first digit to the left of the **decimal**.

The **tenths place** digit is the first digit to the right of the **decimal**.

And, the **hundredths place** digit is the second digit to the right of the **decimal**.

Lastly, the **thousandths place** digit is the third digit to the right of the decimal.

The digit in the **thousandths place** of 5.422 is 0.002.

If the digit number in the **thousandths place** is 5 or greater, round up otherwise truncate.

- 5.422 rounded to the **thousandths place** is 5.42

So type in 5.42.

---

4) Assignment #235358 "235358 - Rounding - Tenths Place"

Round the following number to the **tenths place**.

6.83

Algebra:

✓ 6.8

Hints:

- Since we are rounding to the **tenths place**, we have to use the digit on the **hundredths place**.

- 

6.83

Remember, the **ones place** digit is the first digit to the left of the **decimal**.

The **tenths place** digit is the first digit to the right of the **decimal**.

And, the **hundredths place** digit is the second digit to the right of the **decimal**.

The digit in the **hundredths place** of 6.83 is 003.

If the digit in the **hundredths place** is 5 or greater, round up otherwise truncate.

- 6.83 rounded **tenths place** is 6.8

So type in 6.8.

---

## Order of Operations

### Problem Set "Order of Operations" id:41476

#### 1) Assisment #230905 '230905 - Order of Operations'

$$(7 + 4)^2$$

Fill in:

✓ 121

Hints:

- 

You can use order of operations to find the value of the expression.

Remember the Order of Operations

1. Parenthesis
2. Exponents (powers, roots, etc)
3. Multiplication & Division (from left to right)
4. Addition & Subtraction (from left to right)

This can be remembered as **P****E****M****D****A****S**.

So first, simplify the expression, by simplifying what is inside the parentheses.

$$(7 + 4)^2$$

- Here is the first step of your problem.

$$(7 + 4)^2$$

$$11^2$$

- 

$$(7 + 4)^2$$

$$11^2$$

121 ← This is the answer. Type in 121

---

#### 2) Assisment #230925 '230925 - Order of Operations: Addition & Multiplication'

What is the solution to the expression below?

$$2 + 2 \times 4$$

Fill in:

✓ 10

Hints:

-

You can use order of operations to find the value of the expression.

Remember the Order of Operations

1. Parenthesis
2. Exponents (powers, roots, etc)
3. Multiplication & Division (from left to right)
4. Addition & Subtraction (from left to right)

This can be remembered as **PEMDAS**.

So first simplify the expression, by simplifying what is inside the parentheses.

$$(2+4)^2$$

- According to **PEMDAS**, Multiplication comes before Addition.

Therefore 2 and 4 are multiplied before adding 2.

$$\begin{array}{c} 2 + 2 \times 4 \\ \downarrow \\ 2 + 8 \end{array}$$

- $$\begin{array}{c} 2 + 2 \times 4 \\ \downarrow \\ 2 + 8 \\ \downarrow \\ 10 \end{array}$$

---

### 3) Assignment #230965 "230965 - 107867 - Order of Operations (Template)"

$$(6 + 2)^2$$

Algebra:

✓  $(6 + 2)^2$

Hints:

- Using order of operations, you need to solve inside the parenthesis first and then square your answer. Here is a similar problem.

$$(3 + 8)^2$$

$$11^2$$

$$121$$

- Here is the first step of your problem.

$$(6 + 2)^2$$

$$8^2$$

•

$$(6 + 2)^2$$

$$8^2$$

64 ← This is the answer. Type in 64



You can use order of operations to find the value of the expression.

Remember the Order of Operations

1. Parenthesis
2. Exponents (powers, roots, etc)
3. Multiplication & Division (from left to right)
4. Addition & Subtraction (from left to right)

This can be remembered as **PEMDAS**.

So first simplify the expression, by simplifying what is inside the parentheses.

$$(2+4)^2$$

- According to **PEMDAS**, Multiplication comes before Addition.

Therefore 2 and 4 are multiplied before adding 2.

$$\begin{array}{c} 2 + 2 \times 4 \\ \downarrow \\ 2 + 8 \end{array}$$

$$\begin{array}{c} \bullet \\ 2 + 2 \times 4 \\ \downarrow \\ 2 + 8 \\ \downarrow \\ 10 \end{array}$$

---

### 3) Assignment #230965 "230965 - 107867 - Order of Operations (Template)"

$$(6 + 2)^2$$

Algebra:

✓  $(6 + 2)^2$

Hints:

- Using order of operations, you need to solve inside the parenthesis first and then square your answer. Here is a similar problem.

$$(3 + 8)^2$$

$$11^2$$

$$121$$

- Here is the first step of your problem.

$$(6 + 2)^2$$

$$8^2$$

•

$$(6 + 2)^2$$

$$8^2$$

64 ← This is the answer. Type in 64

---

4) Assisment #230985 "230985 - Order of Operations (Template)"

$$8 \cdot 6 + 10^2$$

Algebra:

✓  $(8 \cdot 6) + (10^2)$

Hints:

- To solve this problem you need to remember the order of operations. Here is a similar problem with the steps to solve.

$$6 \cdot 7 + 5^2$$

Order of Operations

Parenthesis - None in this problem

$$6 \cdot 7 + 5^2$$

Exponents

$$6 \cdot 7 + 25$$

$$5^2 = 5 \cdot 5 = 25$$

Multiplication or Division from left to right

$$42 + 25$$

Addition or Subtraction from left to right

$$67$$

- Here is how to solve the first step of the problem.

$$8 \cdot 6 + 10^2$$

$$8 \cdot 6 + 100$$

$$8 \cdot 6 + 10^2$$

$$8 \cdot 6 + 100$$

$$48 + 100$$

$$148 \leftarrow \text{This is the answer. Type in 148}$$

---

5) Assisment #231025 "231025 - Order of Operations"

$$(3 + 5)^2$$

Fill in:

✓ 64

Hints:

- You can use order of operations to find the value of the expression.

Remember the Order of Operations

1. Parenthesis

2. Exponents (powers, roots, etc)

3. Multiplication & Division (from left to right)

4. Addition & Subtraction (from left to right)

This can be remembered as **P**EMD**A**S.

So first, simplify the expression, by simplifying what is inside the parentheses.

$$(3 + 5)^2$$

- Here is the first step of your problem.

$$(3 + 5)^2$$

$$8^2$$

•

$$(3 + 5)^2$$

$$8^2$$

64 ← This is the answer. Type in 64

---

6) Assignment #231045 "231045 - 107869 - Order of Operations: Addition & Multiplication (Template)"

What is the solution to the expression below?

$$7 + 5 \times 5$$

Algebra:

✓ 32

Scaffold:

You did not solve the expression in the correct order.

The correct *Order of Operations* is:

1. perform all operations with sets of **p**arenthesis first
2. solve all **e**xponents second (powers, roots, etc)
3. perform all **m**ultiplication & **d**ivision (from left to right) third
4. perform all **a**ddition & **s**ubtraction (from left to right) last
- 5.

the *Order of Operations* can easily be remembered as ...

**P**EMD**A**S: **p**arenthesis, **e**xponents, **m**ultiplication & **d**ivision, **a**ddition & **s**ubtraction

Looking again at the original expression.

$$7 + 5 \times 5$$

What is the solution to the very first operation?

**Algebra:**

✓ 25

✗ 12

- Nope, that's wrong. Looks like you performed  $a + b$  but this shouldn't come first according to our Order of Operations.

Try again.

✗ 35

- Whoa, looks like you tried to multiply  $a$  by  $c$ ! That's really against the rules!

Try again.

✗ 12

- Whoa, looks like you tried to add  $a$  to  $c$ ! That's really against the rules!

Try again.

**Scaffold:**

What is the final solution?

$$\begin{array}{c} 7 + 5 \times 5 \\ \downarrow \\ 7 + 25 \end{array}$$

**Algebra:**

✓ 32

**Hints:**

- Remember the *Order of Operations*

1. **P**arenthesis
2. **E**xponents (powers, roots, etc)
3. **M**ultiplication & **D**ivision (from left to right)
4. **A**ddition & **S**ubtraction (from left to right)
- 5.

this can be remembered as **PEMDAS**

- According to **PEMDAS**, **Multiplication** comes before **Addition**.

Therefore  $5$  and  $5$  are multiplied before adding  $7$ .

$$\begin{array}{c} 7 + 5 \times 5 \\ \downarrow \\ 7 + 25 \end{array}$$

•  
 $7 + 5 \times 5$

# Algebra Problem Sets

## Warm Up

2/28/12

Assignment - Printing Context

### Problem Set "Warm Up Gold" id:[38040]

#### 1) Assignment #237139 "237139 - Welcome to Assist..."

Welcome to Assignments! This will show you what to expect.

Example:

What is  $2 + 2$ ?

Click on Show Hint 1 below.

Fill in:

✓ 4

Hints:

- 

If you click on Show Hints it marks the question as wrong.

Click on Show Hint **ONLY** if you are stuck and want to know the answer.

The answer is 4. Type 4 and click submit.

---

#### 2) Assignment #237157 "237157 - The last example ..."

The last example you had to input the answer.

Here is an example of multiple choice:

What does  $2 + 2 =$ ?

Select the correct answer and continue.

Multiple choice:

✗ 1

✗ 2

✗ 3

✓ 4

Hints:

- Remember, if you click show hints, this question will be marked as wrong, however it will tell you the answer.

The answer to this problem is 4. Select 4 and click submit.

---

#### 3) Assignment #237158 "237158 - The last two exam..."

The last two examples will be closer to actual questions you will have.

What is 21 divided by 3?

**Fill in:**

✓ 7

**Hints:**

- 21 divided by 3 is 7.

Type in 7.

---

**4) Assessment #237159 "237159 - This is your last..."**

This is your last problem. Remember if you have any problems with a question, please e-mail [accuhelp@gmail.com](mailto:accuhelp@gmail.com). Good luck!

What is  $143 + 29$ ?

**Fill in:**

✓ 172

**Hints:**

- The answer is 172.

Type in 172.

---

## Pre-Test

2/29/12

Assessment - Printing Content

### Problem Set "Elementary Algebra Accuplacer ASSISTments Evaluation - A" id:[37143]

#### 1) Assessment #227867 "227867 - #1"

A 20% iodine solution is mixed with a 70% iodine solution to produce 5 gallons of 50% Iodine solution. How many gallons of each solution are needed?

**Multiple choice:**

- ☐ A 3 gal of 20% solution, and 2 gal of 70% solution
- ☐ B 3 gal of 20% solution, and 3 gal of 70% solution
- ☐ C 2 gal of 20% solution, and 4 gal of 70% solution
- ☒ D 2 gal of 20% solution, and 3 gal of 70% solution

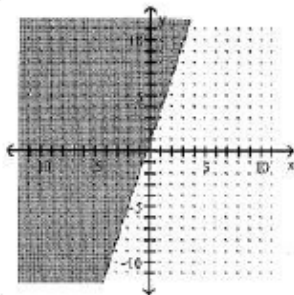
**Hints:**

- D 2 gal of 20% solution, and 3 gal of 70% solution.

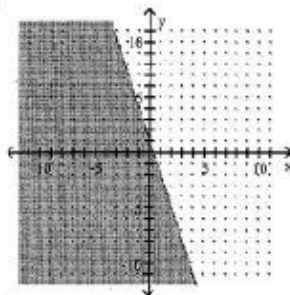
#### 2) Assessment #227868 "227868 - #2"

Graph the linear inequality:  $y < -3x + 1$

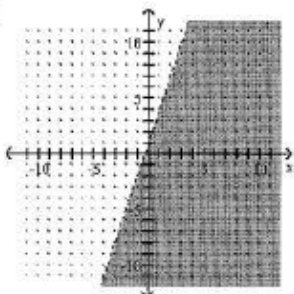
A)



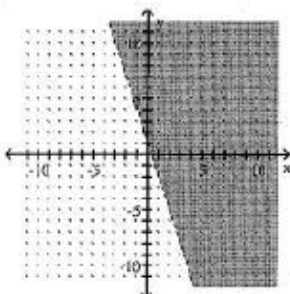
B)



C)



D)



**Multiple choice:**

- ☐ A
- ☒ B
- ☐ C
- ☐ D

2/29/12

Assisment - Printing Content

**Hints:**

- The answer is B.

**3) Assisment #227869 ''227869 - #3''**

Factor:

$$w^2 r^2 - 1$$

**Multiple choice:**

- ☒ A  $(w - r)(w + r)$
- ☒ B  $(wr + 1)^2$
- ☒ C  $(wr - 1)(wr + 1)$
- ☒ D  $(wr - 1)^2$

**Hints:**

- The answer is C  $(wr - 1)(wr + 1)$ .

**4) Assisment #227870 ''227870 - #4''**

A car rental business rents a compact car at a daily rate of \$38.20 plus 20 cents per mile. Mike can afford to spend \$63 on the rental car for one day. How many miles can he drive and stay within his budget?

**Multiple choice:**

- ☒ A 119 miles
- ☒ B 129 miles
- ☒ C 124 miles
- ☒ D 114 miles

**Hints:**

- The answer is C 124 miles.

**5) Assisment #227871 ''227871 - #5''**

Divide:

$$\frac{28s^3 - 24s^2 + 24s}{4s}$$

**Multiple choice:**

- ☒ A  $7s^3 - 6s^2 + 6s$
- ☒ B  $-7s^2 + 6s - 6$
- ☒ C  $7s^2 - 6s + 6$
- ☒ D  $-7s^3 + 6s^2 - 6s$

**Hints:**

- The answer is B  $-7s^2 + 6s - 6$ .

**6) Assisment #227872 ''227872 - #6''**



Simplify, assuming all variables represent non negative real numbers.

$$\frac{\sqrt{81x^4}}{\sqrt{3x}}$$

**Multiple choice:**

- ☒ A  $9x\sqrt{3x}$
- ☒ B  $3x\sqrt{3x}$
- ☒ C  $9x^2\sqrt{3x}$
- ☒ D  $3x^2\sqrt{3x}$

**Hints:**

- The answer is B  $3x\sqrt{3x}$ .

7) Assignment #227873 "227873 - #7"

Simplify, assuming all variables represent non negative real numbers.  $\sqrt{32yx^2}$

**Multiple choice:**

- ☒ A  $4xy^2\sqrt{2}$
- ☒ B  $4x\sqrt{2y}$
- ☒ C  $4xy\sqrt{2}$
- ☒ D  $4x^2\sqrt{2y}$

**Hints:**

- The answer is B  $4x\sqrt{2y}$ .

8) Assignment #227874 "227874 - #8"

Determine whether 3 is a solution of the equation  $9y + 8(y-2) = 35$

**Multiple choice:**

- ☒ A 3 is a solution
- ☒ B 3 is not a solution

**Hints:**

- The answer is A 3 is a solution.

9) Assignment #227875 "227875 - #9"

$(x+9)(x-5) = -13$

**Multiple choice:**

- ☒ A 4,8
- ☒ B 9,-5
- ☒ C -9, 5
- ☒ D -8,4

**Hints:**

- The answer is D -8,4

10) Asskment #227876 "227876 - #10"

Simplify:  $-9 + 5(-2) - 11$

Multiple choice:

- ☐ A -39
- ☒ B -30
- ☐ C -58
- ☐ D -10

Hints:

- The answer is B -30.

11) Asskment #227877 "227877 - #11"

Divide:  $\frac{a^2 - 36}{a^2 + 9a + 14}$  by  $\frac{a^2 - a - 42}{a^2 - 49}$

Multiple choice:

- ☒ A  $(a-6)/(a+2)$
- ☐ B  $(a+6)/(a+2)$
- ☐ C  $(a-6)(a+6)^2/((a+2)(a+7)^2)$
- ☐ D  $(a-7)/(a+2)$

Hints:

- The answer is A  $(a-6)/(a+2)$ .

12) Asskment #227878 "227878 - #12"

Multiply  $(4x - 1)(6x + 2)$

Multiple choice:

- ☒ A  $24x^2 + 2x - 2$
- ☐ B  $24x^2 + 2x + 2$
- ☐ C  $10x^2 + 2x + 2$
- ☐ D  $10x^2 + 2x - 2$

Hints:

- The answer is A  $24x^2 + 2x - 2$ .

13) Asskment #227879 "227879 - #13"

In the right triangle shown, find the length of the missing side



Multiple choice:

- ☒ A 20cm
- ☐ B 25cm
- ☐ C 24cm
- ☐ D 17.5cm

Hints:

- The answer is A 20cm.

---

14) Assignment #227880 "227880 - #14"

Solve the system of equations:  $5x + y = 24$  and  $x + 3y = 2$

Multiple choice:

- ☐ A (5,4)
- ☐ B (4,4)
- ☐ C (-5,-1)
- ☒ D (5,-1)

Hints:

- The answer is D (5,-1).
-

# Post Test

2/29/12

Assessment - Printing Contest

## Problem Set "Elementary Algebra Accuplacer ASSISTments Evaluation - B" id:[37140]

### 1) Assessment #227672 "227672 - #1"

Factor:

$$b^2 t^2 - 1$$

Multiple choice:

- ☐ A  $(bt + 1)^2$
- ☒ B  $(bt + 1)(bt - 1)$
- ☐ C  $(b - t)(b + t)$
- ☐ D  $(bt - 1)^2$

Hints:

- The answer is B  $(bt + 1)(bt - 1)$ .

---

### 2) Assessment #227673 "227673 - #2"

Solve the system of equations.  $3x + y = 22$  &  $x + 3y = 18$

Multiple choice:

- ☐ A  $(-6, 4)$
- ☐ B  $(6, 5)$
- ☒ C  $(6, 4)$
- ☐ D  $(8, -2)$

Hints:

- The answer is C  $(6, 4)$ .

---

### 3) Assessment #227674 "227674 - #3"

Multiply.  $(2x - 3)(3x + 9)$

Multiple choice:

- ☐ A  $(6x^2 + 9x + 9)$
- ☐ B  $(5x^2 + 9x + 9)$
- ☒ C  $(6x^2 + 9x - 27)$
- ☐ D  $(5x^2 + 9x - 27)$

Hints:

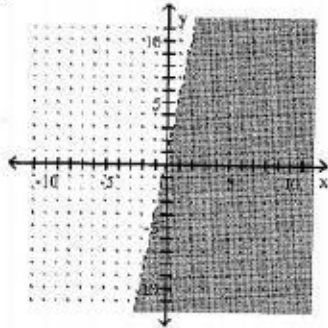
- The answer is C  $(6x^2 + 9x - 27)$ .

---

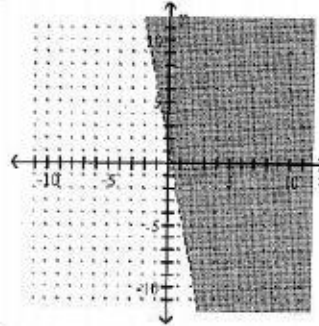
### 4) Assessment #227675 "227675 - #4"

Graph the linear inequality.  $y < -5x + 1$

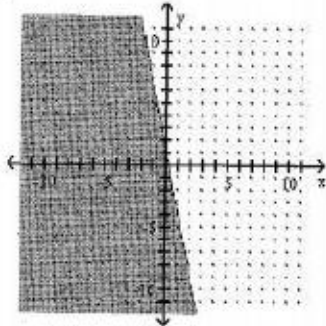
A)



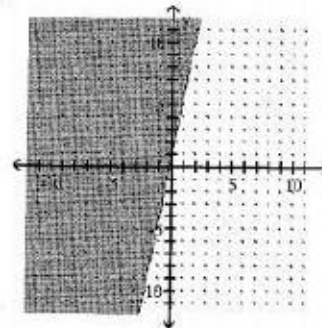
B)



C)



D)

**Multiple choice:**

- ☒ A  
☒ B  
☒ C  
☒ D

**Hints:**

- The answer is C.

5) Assignment #227676 "227676 - #5"

A 30% iodine solution is mixed with a 60% iodine solution to produce 3 gallons of 40% Iodine solution. How many gallons of each solution are needed?

**Multiple choice:**

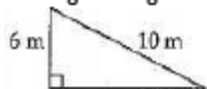
- ☒ A 2 gal of 30% solution, 2 gal of 60% solution  
☒ B 2 gal of 30% solution, 1 gal of 60% solution  
☒ C 1 gal of 30% solution, 2 gal of 60% solution  
☒ D 3 gal of 30% solution, 1 gal of 60% solution

**Hints:**

- The answer is B 2 gal of 30% solution, 1 gal of 60% solution.

## 6) Assessment #227677 "227677 - #6"

In the right triangle shown, find the length of the missing side.



## Multiple choice:

- ☐ A 10m  
☐ B 9m  
☐ C 7m  
☒ D 8m

## Hints:

- The answer is D 8m.

## 7) Assessment #227678 "227678 - #7"

Divide:

$$\frac{14s^3 - 12s^2 + 12s}{2s}$$

## Multiple choice:

- ☐ A  $7s^3 - 6s^2 + 6s$   
☐ B  $-7s^3 + 6s^2 - 6s$   
☐ C  $7s^2 - 6s + 6$   
☒ D  $-7s^2 + 6s - 6$

## Hints:

- The answer is D  $-7s^2 + 6s - 6$ .

## 8) Assessment #227679 "227679 - #8"

Divide:  $\frac{a^2 - 81}{a^2 + 4a - 32}$  by  $\frac{a^2 + a - 72}{a^2 - 64}$

## Multiple choice:

- ☐ A  $(a+9)/(a-4)$   
☐ B  $(a-9)(a+9)^2/((a-4)(a+8)^2)$   
☒ C  $(a-9)/(a-4)$   
☐ D  $(a-8)/(a-4)$

## Hints:

- The answer is C  $(a-9)/(a-4)$ .

## 9) Assessment #227680 "227680 - #9"

Simplify, assuming all variables represent non negative real numbers.

$$\frac{\sqrt{64x^4}}{\sqrt{2x}}$$

**Multiple choice:**

- ☐ A  $8x^2\sqrt{2x}$
- ☐ B  $4x^2\sqrt{2x}$
- ☒ C  $4x\sqrt{2x}$
- ☐ D  $8x\sqrt{2x}$

**Hints:**

- The answer is C  $4x\sqrt{2x}$ .

## 10) Assessment #227681 "227681 - #10"

Simplify, assuming all variables represent non negative real numbers.  $\sqrt{28yx^2}$ **Multiple choice:**

- ☒ A  $2x\sqrt{7y}$
- ☐ B  $2xy\sqrt{7}$
- ☐ C  $2x^2\sqrt{7y}$
- ☐ D  $2xy^2\sqrt{7}$

**Hints:**

- The answer is A  $2x\sqrt{7y}$ .

## 11) Assessment #227682 "227682 - #11"

Determine whether 7 is a solution of the equation  $2y + 5(y-4) = 29$ .**Multiple choice:**

- ☒ A 7 is a solution
- ☐ B 7 is not a solution

**Hints:**

- The answer is A 7 is a solution.

## 12) Assessment #227683 "227683 - #12"

 $(x+10)(x-9) = -18$ **Multiple choice:**

- ☒ A -9,8
- ☐ B -10,9
- ☐ C 10, -9
- ☐ D 8,9

**Hints:**

- The answer is A -9,8.

---

**13) Assessment #227684 "227684 - #13"**

A car rental business rents a compact car at a daily rate of \$34.20 plus 20 cents per mile. Mike can afford to spend \$51 on the rental car for one day. How many miles can he drive and stay within his budget?

**Multiple choice:**

- ☐ A 89 miles
- ☐ B 74 miles
- ☒ C 84 miles
- ☐ D 79 miles

**Hints:**

- The answer is C 84 miles.

---

**14) Assessment #227685 "227685 - #14"**

Simplify:  $-9 + 4(-2)$  -11

**Multiple choice:**

- ☐ A -49
- ☒ B -28
- ☐ C -37
- ☐ D -12

**Hints:**

- The answer is B -28



# Problem Sets

## Computation with Real Numbers

---

2/29/12

Assignment - Printing Context

### Problem Set "Sequence #41536" id:[41536]

#### 1) Assignment #233216 "233216 - Subtraction - two negative numbers"

What is  $-349.26 - (-323.86)$ ?

Fill in:

- ✓ -25.4
- ✓ -25.4

Hints:

- Subtracting a negative is the same as adding a positive, so you can rewrite this problem as:

$$-349.26 + 323.86$$

How would you add a positive and a negative number?

- When you add numbers of opposite signs, you just subtract their absolute values.

The answer has the same sign as the greater number.

For example,  $-2 + 1 = -1$ , and  $-3 + 4 = 1$ .

So what is  $-349.26 + 323.86$ ?

(Remember, this is still the same as  $-349.26 - (-323.86)$ )

- $-349.26 - (-323.86) = -349.26 + 323.86 = -25.4$ . Type in -25.4.

---

#### 2) Assignment #233236 "233236 - Addition - two negative numbers"

What is  $-187.882 + -462.119$ ?

Fill in:

- ✓ -650.001
- ✓ -650.0

Hints:

- Adding two negative numbers is the same as adding two positive numbers, just with a negative answer.

For example,  $-1 + -2 = -3$ , and  $-3 + -4 = -7$ .

So what is  $-187.882 + -462.119$ ?

- $-187.882 + -462.119 = -650.001$ . Type in -650.001.

---

#### 3) Assignment #233257 "233257 - Subtraction - one positive, one negative number"

What is  $432.62 - (-137.49)$ ?

**Fill in:**

✓ 570.11

✓ 570.1

**Hints:**

- One way to think about subtracting is to change it to adding the opposite:

One example:  $1 - (-2) = 1 + 2 = 3$ , and

Another example:  $-3 - 4 = -3 + -4 = -7$

So you can rewrite  $432.62 - (-137.49)$  as  $432.62 + 137.49$ .

- Since both numbers are negative you are just adding a distance to the left with another distance to the left so just add the values.

$$\begin{array}{r} 432.62 \\ + 137.49 \\ \hline 570.11 \end{array}$$

Type in 570.11.

**4) Assessment #233277 "233277 - Multiplication - one positive, one negative number"**

What is  $930 \times -70$ ?

**Fill in:**

✓ -65100

✓ -65100.0

**Hints:**

- Multiplying a positive and a negative number is the same as multiplying two positive numbers, except the answer is always negative.

For example,  $3 \times -2 = -6$ , and  $-4 \times 5 = -20$ .

So you know the answer will be negative.

- When you multiply the absolute values you get:

$$\begin{array}{r} 930 \\ \times 70 \\ \hline \end{array}$$

65100

Because you're actually multiplying one negative and one positive number, the answer is negative.

So  $930 \times -70 = -65100$ .

Type in -65100.

5) Assessment #233295 "233295 - Multiplication - one positive, one negative number"

What is  $0.6 \times -300$ ?

Fill in:

✓ -180

✓ -180.0

Hints:

- Multiplying a positive and a negative number is the same as multiplying two positive numbers, except the answer is always negative.

For example,  $3 \times -2 = -6$ , and  $-4 \times 5 = -20$ .

So you know the answer will be negative.

- When you multiply the absolute values you get:

0.6

$\times 300$

180

Because you're actually multiplying one negative and one positive number, the answer is negative.

So  $0.6 \times -300 = -180$ .

Type in -180.

6) Assessment #233317 "233317 - Division - one positive, one negative number"

What is  $-686 \div 49$ ?

Fill in:

✓ -14

✓ -14.0

**Hints:**

- Dividing a positive and a negative number is like dividing two positive numbers, except the answer is always negative.

For example,  $4 \div -2 = -2$ , and  $-9 \div 3 = -3$ .

So the answer will be negative.

- $-686 \div 49 = -14$ . Type in -14.

**7) Assessment #233336 "233336 - Multiplication - two negative numbers"**

What is  $-45.2 \times -23.3$ ?

**Fill in:**

✓ 1053.16

✓ 1053.2

**Hints:**

- Multiplying two negative numbers is exactly the same as multiplying two positive numbers, since the negative signs cancel each other out.

For example,  $-2 \times -2 = 2 \times 2 = 4$ .

So the problem can be rewritten as

$$\begin{array}{r} 45.2 \\ \times 23.3 \\ \hline \end{array}$$

- $-45.2 \times -23.3 = 1053.16$ . Type in 1053.16.

**8) Assessment #233356 "233356 - Division - two negative numbers"**

What is  $-2.4 \div -1$ ?

**Fill in:**

✓ 2.4

✓ 2.4

**Hints:**

- Dividing two negative numbers is exactly the same as dividing two positive numbers, because the negative signs cancel each other out.

For example,  $4 \div 2 = -4 \div -2 = 2$ .

So the problem can be rewritten as  $2.4 \div 1$ .

- $-2.4 \div -1 = 2.4$ . Type in 2.4.
-

## Order of Operations With Signed Numbers

2/29/12

Assignment - Printing Content

### Problem Set "Sequence #41538" id:[41538]

1) Assignment #231065 '231065 - 27971 - 7th Grade: Accentuate the Negative - Evaluate the expression'

What is the value of this expression?

$$(-3+6)^2$$

**Algebra:**

✓ 9

**Hints:**

- 

You can use order of operations to find the value of the expression  $(4-7)^2$ .

Remember the Order of Operations

1. Parenthesis
2. Exponents (powers, roots, etc)
3. Multiplication & Division (from left to right)
4. Addition & Subtraction (from left to right)

This can be remembered as **PEMDAS**.

So first, simplify the expression, by simplifying what is inside the parentheses.

$$(-3+6)^2$$

$$(3)^2$$

- 

- Remember,  $(3)^2$  is the same as  $3 * 3$

- Also remember the rules for multiplying integers:

<b>even</b> number of negatives	$-1 * -1 = +1$
---------------------------------	----------------

<b>odd</b> number of negatives	$-1 * +1 = -1$
--------------------------------	----------------

<b>odd</b> number of negatives	$+1 * -1 = -1$
--------------------------------	----------------

<b>no</b> negatives	$+1 * +1 = +1$
---------------------	----------------

- $(-3+6)^2$

$$(3)^2$$

$$3 * 3$$

$$9$$

The value of  $(-3+6)^2$  is 9.

Type in 9.

## 2) Assessment #231099 "231099 - 30310 - Squaring an Expression"

What is the value of this expression?

$$(8 - 7)^2$$

**Algebra:**

✓ 1

**Hints:**

•

You can use order of operations to find the value of the expression  $(4-7)^2$ .

Remember the Order of Operations

1. Parenthesis
2. Exponents (powers, roots, etc)
3. Multiplication & Division (from left to right)
4. Addition & Subtraction (from left to right)

This can be remembered as **PEMDAS**.

So first, simplify the expression, by simplifying what is inside the parentheses.

$$(8-7)^2$$

$$(1)^2$$

•

- Remember,  $(1)^2$  is the same as  $1 * 1$

$$(8-7)^2$$

$$(1)^2$$

$$1 * 1$$

$$1$$

The value of  $(8-7)^2$  is 1.

Type in 1.

## 3) Assessment #231105 "231105 - 27974 - 7th Grade: Accentuate the Negative - Order of Operations"

Find the value:

$$(28 - 37) \div 3^2 - 10(2)$$

**Algebra:**

✓ -21

**Hints:**

- We can use order of operations to find the value of the expression

$$(28 - 37) \div 3^2 - 10(2)$$

$$(28 - 37) \div 3^2 - 10(2)$$

Remember the Order of Operations

1. Parenthesis
2. Exponents (powers, roots, etc)
3. Multiplication & Division (from left to right)
4. Addition & Subtraction (from left to right)

This can be remembered as **PEMDAS**.

So first, find the value inside the parentheses.

$$(28 - 37) \div 3^2 - 10(2)$$

$$-9 \div 3^2 - 10(2)$$

- Next, perform exponential operations.

$$(28 - 37) \div 3^2 - 10(2)$$

$$-9 \div 3^2 - 10(2)$$

$$-9 \div (3 * 3) - 10(2)$$

$$-9 \div 9 - 10(2)$$

- Next, perform multiplication and division operations from left to right.

$$(28 - 37) \div 3^2 - 10(2)$$

$$-9 \div 3^2 - 10(2)$$

$$-9 \div (3 * 3) - 10(2)$$

$$-9 \div 9 - 10(2)$$

$$-1 - 20$$

- Finally, add and subtract.

$$(28 - 37) \div 3^2 - 10(2)$$

$$-9 \div 3^2 - 10(2)$$

$$-9 \div (3 * 3) - 10(2)$$

$$-9 \div 9 - 10(2)$$

$$-1 - 20$$

$$-21$$

The value of  $(28 - 37) \div 3^2 - 10(2)$  is -21 Enter -21

4) Assessment #231145 "231145 - 107857 - 7th Grade: Accentuate the Negative - Order of Operations (Template)"

Find the value:

$$(32 - 96) \div 4^2 - 8(10)$$

**Algebra:**



✓ -84

**Hints:**

- We can use order of operations to find the value of the expression

$$(32 - 96) \div 4^2 - 8(10)$$

Remember the Order of Operations

1. **Parenthesis**
2. **Exponents** (powers, roots, etc)
3. **Multiplication & Division** (from left to right)
4. **Addition & Subtraction** (from left to right)

This can be remembered as **PEMDAS**.

So first, find the value inside the parentheses.

$$(32 - 96) \div 4^2 - 8(10)$$

$$-64 \div 4^2 - 8(10)$$

- Next, perform exponential operations.

$$(32 - 96) \div 4^2 - 8(10)$$

$$-64 \div 4^2 - 8(10)$$

$$-64 \div (4 * 4) - 8(10)$$

$$-64 \div 16 - 8(10)$$

- Next, perform multiplication and division operations from left to right.

$$(32 - 96) \div 4^2 - 8(10)$$

$$-64 \div 4^2 - 8(10)$$

$$-64 \div (4 * 4) - 8(10)$$

$$-64 \div 16 - 8(10)$$

$$-4 - 80$$

- Finally, add and subtract.

$$(32 - 96) \div 4^2 - 8(10)$$

$$-64 \div 4^2 - 8(10)$$

$$-64 \div (4 * 4) - 8(10)$$

$$-64 \div 16 - 8(10)$$

$$-4 - 80$$

$$-84$$

The value of  $(32 - 96) \div 4^2 - 8(10)$  is -84 Enter -84**5) Assignment #231175 "231175 - 108187 - Order of Operations : Addition & Multiplication (Template)"**

What is the solution to the expression below?

[www.assignment.org/build/printsequence/41538?mode=debug](http://www.assignment.org/build/printsequence/41538?mode=debug)

$$-5 + (-6) \cdot (6)$$

**Algebra:**

✓ -41

**Scaffold:**

You did not solve the expression in the correct order.

The correct *Order of Operations* is:

1. 1. perform all operations with sets of **parenthesis** first
2. 2. solve all **exponents** second (powers, roots, etc)
3. 3. perform all **multiplication & division** (from left to right) third
4. 4. perform all **addition & subtraction** (from left to right) last
- 5.

the *Order of Operations* can easily be remembered as...

**PEMDAS:** **p**arenthesis, **e**xponents, **m**ultiplication & **d**ivision, **a**ddition & **s**ubtraction

Looking again at the original expression.

$$-5 + -6 \times 6$$

What is the solution to the very first operation?

**Algebra:**

✓ -36

✗ -11

- Nope, that's wrong. Looks like you performed a + b but this shouldn't come first according to our Order of Operations.

Try again.

✗ -30

- Whoa, looks like you tried to multiply a by c! That's really against the rules!

Try again.

✗ 1

- Whoa, looks like you tried to add a to c! That's really against the rules!

Try again.

**Scaffold:**

# Simplifying Expressions with Addition, Subtraction, Multiplication, Division, and Distribution

2/29/12

Assignment - Printing Content

## Problem Set "Sequence #41543" id:[41543]

### 1) Assignment #232444 "232444 - Assignment #44642 - Polynomial 2B"

Simplify the following:

$$(7x - 8) + (6x - 4)$$

In order to type your answer in you must do just like you do with a graphing calculator:

-no spaces between factors and operations;

-don't use \* for multiplication,

For example:  $4x-7y$

Fill in:

- ✓  $13x-12$
- ✓  $-12+13x$
- ✓  $13x - 12$
- ✓  $-12 + 13x$

Hints:

- In order to begin simplifying the expression, we need to get rid of the parentheses. We can do this by rewriting

$(7x - 8) + (6x - 4)$  becomes

$$7x - 8 + 6x - 4$$

- When we got rid of the parentheses, we got the following term.

$$7x - 8 + 6x - 4.$$

Next, we need to gather all of the "x" terms, and then gather all the constants.

The x terms are  $7x$  and  $+6x$

The constants are  $-8$  and  $-4$

- If we have the expression,

$$7x - 8 + 6x - 4$$

It can be rewritten as

$$7x + 6x - 8 - 4$$

- Now we just need to apply basic arithmetic to simplify the expression.

$$7x + 6x - 8 - 4 \text{ becomes}$$

$$(7 + 6)x - (8 + 4) \text{ which then becomes}$$

$$13x-12$$

Type in  $13x-12$

### 2) Assignment #232446 "232446 - 2 Dist, 1 Comm, Y"

If the following two expressions are equivalent or not:

1.  $-3(2x + 8) + (-4) + (-51x)$

2.  $-57x + (-28)$

Multiple choice:

[www.assistsments.org/build/print/the/sequence/41543?mode=debug](http://www.assistsments.org/build/print/the/sequence/41543?mode=debug)

1/11

✓ Yes, the two expressions are equivalent

✗ No, the two expressions are not equivalent

Hints:

- For this particular problem, you can use Commutative Property to check if the two expressions are equivalent or not.

### Commutative Property:

The "Commutative Property" just means that you can **swap numbers** over and still get the same answer when you **add**, or when you **multiply**.

$$a + b = b + a$$

$$a \times b = b \times a$$

### Associative Property:

The "Associative Property" means that it doesn't matter how you group the numbers (ie which you calculate first) when you **add**:

$$(a + b) + c = a + (b + c)$$

or when you **multiply**:

$$(a \times b) \times c = a \times (b \times c)$$

### Distributive Property:

The "Distributive Property" means that you can apply a multiplication to the individual numbers within the parentheses and still get the same answer when you **add**:

$$a(b + c) = ab + ac$$

or when you **subtract**:

$$a(b - c) = ab - ac$$

Inside the parentheses.

- First, let's break down the expression.

$$-3(2x + 8) + (-4) + (-51x)$$

Can be converted into this:

$$-6x + -24 + -4 + -51x \text{ (Note here that } -3(2x + 8) \text{ was rewritten as } -6x + -24. \text{ Distributive property.)}$$

$$\bullet -6x + -24 + -4 + -51x$$

$$-6x + -51x + -4 + -24 \text{ (Note here that } -24 \text{ and } -51x \text{ swap their places. Commutative Property)}$$

$$(-6 + -51)x + -4 + -24 \text{ (In this expression, } (-6 + -51)x \text{, the distributive property is used on the variable } x)$$

$$-57x + -28$$

Select Yes.

**Scaffold:**

Notice the properties we use in each step while trying to solve the problem:

1.  $-3(2x + 8) + (-4) + (-51x)$
2.  $-6x + (-24) + (-4) + (-51x)$  (Step 1 to 2: Distributive Property)
3.  $-6x + (-51x) + (-24) + (-4)$  (Step 2 to 3: Commutative Property)
4.  $(-6 + (-51))x + (-24) + (-4)$  (Step 3 to 4: Distributive Property)
5.  $-57x + (-28)$  (Step 4 to 5: Addition)

Select Yes

**Multiple choice:**

- ☒ Yes, the two expressions are equivalent
- ☐ No, the two expressions are not equivalent

**3) Assignment #232465 "232465 - 42963 - 2A"**

Simplify the following:

$$8x + 4 - 2x + 8$$

In order to type your answer in you must do just like you do with a graphing calculator:

- no spaces between factors and operations;
- don't use \* for multiplication,

For example:  $4x-7$

**Fill in:**

- ☒  $6x+12$
- ☒  $12+6x$
- ☒  $6x + 12$
- ☒  $12 + 6x$

**Hints:**

- In order to simplify the expression, we need to gather all the "x" terms, and then gather the constants.

The x terms are  $8x$  and  $- 2x$

The constants are  $+ 4$  and  $+ 8$

- If we have the expression,

$$8x + 4 - 2x + 8$$

It can be rewritten as

$$3x - 2x + 4 + 8$$

- Now we just need to apply basic arithmetic to simplify the expression.

$$3x - 2x + 4 + 8 \text{ becomes}$$

$$(3 - 2)x + (4 + 8) \text{ which then becomes}$$

$$1x + 12$$

Type in 6x+12

#### 4) Assignment #232478 "232478 - 9c"

Are the following two expressions equivalent?

1.  $(43x + 40) + (20x - 26)$
2.  $63x + 14$

#### Multiple choice:

- ☒ Yes, they are equivalent.
- ☐ No, they are not equivalent.

#### Hints:

- Let's start simplifying the expression. Notice we want to get the blue terms with x in them together and the red terms without the variables together.

$$(20x + 40) + (23x - 26)$$

$$(20x + 23x) + (40 - 26) \text{ (Commutative and Associative Property)}$$

- $(20 + 23)x + (40 - 26)$  (Distributive Property)
- $$43x + 14$$

Select 'Yes'

#### Scaffold:

Let's start simplifying the expression. Notice we want to get the blue terms with x in them together and the red terms without the variables together.

$$(43x + 40) + (20x - 26)$$

$$(43x + 20x) + (40 - 26) \text{ (Commutative and Associative Property)}$$

$$(43 + 20)x + (40 - 26) \text{ (Distributive Property)}$$

$$63x + 14$$

Select 'Yes'

**Multiple choice:**

- ✓ Yes, these expressions are equivalent.
- ✗ No, they are not equivalent.

**5) Assessment #232498 "232498 - Assessment #44642 - Polynomial 2B"**

Simplify the following

$$(3x - 6) - (8x + 5)$$

In order to type your answer in you must do just like you do with a graphing calculator:

- no spaces between factors and operations;
- don't use \* for multiplication,

For example:  $4x-7y$

**Fill in:**

- ✓  $-5x - 11$
- ✓  $-5x-11$
- ✓  $-11+5x$
- ✓  $-11 + -5x$

**Hints:**

- In order to begin simplifying the expression, we need to get rid of the parentheses. We can do this by rewriting  $(3x - 6) - (8x + 5)$  as  $(3x - 6) + -1*(8x + 5)$  and then multiplying the -1 across the parentheses.
- $(3x - 6) + -1*(8x + 5)$  becomes  $3x - 6 + -8x - 5$ .

Next, we need to gather all of the "x" terms, and then gather the constants.

The x terms are  $3x$  and  $-8x$

The constants are  $-6$  and  $-5$

- If we have the expression,

$$3x - 6 + -8x - 5$$

It can be rewritten as

$$3x - 8x + -6 - 5$$

- Now we just need to apply basic arithmetic to simplify the expression.

$$3x - 8x + -6 - 5 \text{ becomes}$$

$$(3 - 8)x + (-6 - 5)$$

and factoring out a -1 from the constants:

$$(3 - 8)x - (6 + 5)$$

- $(3 - 8)x - (6 + 5)$  becomes

$$-5x - 11$$

Type in  $-5x - 11$

#### 6) Assignment #232504 "232504 - 7c"

If the following two expressions are equivalent or not:

1.  $16x + 40 + (-21x)$
2.  $-5x + 40$

#### Multiple choice:

- ✓ Yes, the two expressions are equivalent  
 ✗ No, the two expressions are not equivalent

#### Scaffold:

Notice that the **green** terms with x value can be grouped together by swapping the places of **40** and **-21x**.

$$16x + 40 + (-21x)$$

$$16x + (-21x) + 40 \text{ (Commutative Property)}$$

$$(16 + (-21))x + 40 \text{ (Distributive Property)}$$

$$-5x + 40 \text{ (Addition)}$$

Select 'Yes'

#### Multiple choice:

- ✓ Yes, the two expressions are equivalent  
 ✗ No, the two expressions are not equivalent

#### Hints:

- For this particular problem, you can use **Commutative Property** to check if the two expressions are equivalent or not.

### Commutative Property:

The "Commutative Property" just means that you can **swap numbers** over and still get the same answer when you **add**, or when you **multiply**.

$$a + b = b + a$$

$$a \times b = b \times a$$

### Associative Property:

The "Associative Property" means that it doesn't matter how you group the numbers (ie which you



calculate first) when you **add**:

$$(a + b) + c = a + (b + c)$$

or when you **multiply**:

$$(a \times b) \times c = a \times (b \times c)$$

- $16x + 40 + -21x$

$16x + -21x + 40$  (Note here that  $40$  and  $-21x$  swap their places. Commutative Property)

$(16 + -21)x + 40$  (In this expression,  $(16 + -21)x$ , the distributive property is used on the variable  $x$ )

$-5x + 40$

Select Yes.

#### 7) Assessment #232527 "232527 - 2 Dist, 1 Comm, Y"

Are the following two expressions are equivalent or not:

1.  $-6(3x + 11) + (-31) + (-10x)$
2.  $-23x + (-97)$

**Multiple choice:**

- ☒ Yes, the two expressions are equivalent
- ☐ No, the two expressions are not equivalent

**Hints:**

- For this particular problem, you can use Commutative Property to check if the two expressions are equivalent or not.

### Commutative Property:

The "Commutative Property" just means that you can **swap numbers** over and still get the same answer when you **add**, or when you **multiply**.

$$a + b = b + a$$

$$a \times b = b \times a$$

### Associative Property:

The "Associative Property" means that it doesn't matter how you group the numbers (ie which you calculate first) when you **add**:

$$(a + b) + c = a + (b + c)$$

or when you **multiply**:

$$(a \times b) \times c = a \times (b \times c)$$

## Distributive Property:

The "Distributive Property" means that you can apply a multiplication to the individual numbers within the parentheses and still get the same answer when you **add**:

$$a(b + c) = ab + ac$$

or when you **subtract**:

$$a(b - c) = ab - ac$$

Inside the parentheses.

- First, let's break down the expression.

$$-6(3x + 11) + (-31) + (-10x)$$

Can be converted into this:

$$-18x + -66 + -31 + -10x \text{ (Note here that } -6(3x + 11) \text{ was rewritten as } -18x + -66. \text{ Distributive property.)}$$

- $-18x + -66 + -31 + -10x$

$$-18x + -10x + -31 + -66 \text{ (Note here that } -66 \text{ and } -10x \text{ swap their places. Commutative Property)}$$

$$(-18 + -10)x + -31 + -66 \text{ (In this expression, } (-18 + -10)x \text{, the distributive property is used on the variable } x)$$

$$-28x + -97$$

Select No.

### Scaffold:

Notice the properties we use in each step while trying to solve the problem:

1.  $-6(3x + 11) + (-31) + (-10x)$
2.  $-18x + (-66) + (-31) + (-10x)$  (Step 1 to 2: Distributive Property)
3.  $-18x + (-10x) + (-66) + (-31)$  (Step 2 to 3: Commutative Property)
4.  $(-18 + (-10))x + (-66) + (-31)$  (Step 3 to 4: Distributive Property)
5.  $-28x + (-97)$  (Step 4 to 5: Addition)

Select No

### Multiple choice:

- ☒ Yes, the two expressions are equivalent
- ☒ No, the two expressions are not equivalent

8) Assignment #232547 "232547 - 43053 - 42963 - 2A"

Simplify the following:

[www.assignment.org/build/printsequence/41543?mode=debug](http://www.assignment.org/build/printsequence/41543?mode=debug)

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$$8x - 8y + 3x - 5y - 4x + 5x$$

In order to type your answer in you must do just like you do with a graphing calculator:

-no spaces between factors and operations;

-don't use \* for multiplication,

For example:  $4x-7$

**Fill in:**

✓  $12x-13y$

✗  $20x-13y$

- Check the signs on the "x" terms.

✗  $12x-3y$

- Make sure any factoring done in the "y" terms is correct. Also check the signs of the "y" terms.

✗  $12x-13y$

- Make sure to change the "y" terms when you factor out a -1.

✓  $-13y+12x$

✓  $12x - 13y$

✓  $-13y + 12x$

**Hints:**

- In order to simplify the expression, we need to gather all the "x" terms, and all the "y" terms.

The x terms are  $+8x$ ,  $+3x$ ,  $-4x$ , and  $+5x$

The y terms are  $-8y$  and  $-5y$

- If we have the expression,

$$8x - 8y + 3x - 5y - 4x + 5x$$

It can be rewritten as

$$8x + 3x - 4x + 5x - 8y - 5y$$

- Now we just need to apply basic arithmetic to simplify the expression.

$$8x + 3x - 4x + 5x - 8y - 5y \text{ becomes}$$

$$(8 + 3 - 4 + 5)x + (-8 - 5)y \text{ and factoring out a -1 from the "y" terms:}$$

$$(8 + 3 - 4 + 5)x - (8 + 5)y \text{ which then becomes}$$

$$12x - 13y$$

Type in 12x-13y

9) Assessment #232568 "232568 - 7c"

If the following two expressions are equivalent or not:

1.  $7x + (-29) + (-5x)$
2.  $1x + (-29)$

**Multiple choice:**

- ☒ Yes, the two expressions are equivalent
- ☐ No, the two expressions are not equivalent

**Hints:**

- For this particular problem, you can use **Commutative Property** to check if the two expressions are equivalent or not.

## Commutative Property:

The "Commutative Property" just means that you can **swap numbers** over and still get the same answer when you **add**, or when you **multiply**.

$$\begin{aligned} a + b &= b + a \\ a \times b &= b \times a \end{aligned}$$

## Associative Property:

The "Associative Property" means that it doesn't matter how you group the numbers (ie which you calculate first) when you **add**:

$$(a + b) + c = a + (b + c)$$

or when you **multiply**:

$$(a \times b) \times c = a \times (b \times c)$$

- $7x + -29 + -5x$   
 $7x + -5x + -29$  (Note here that  $-29$  and  $-5x$  swap their places. Commutative Property)  
 $(7 + -5)x + -29$  (In this expression,  $(7 + -5)x$ , the distributive property is used on the variable  $x$ )  
 $2x + -29$   
 Select No.

## Solving Linear Equations

2/29/12

Assessment - Printing Content

### Problem Set "Sequence #41545" id:[41545]

#### 1) Assessment #235061 "235061 - Solving Equations"

Solve for x.

$$8(9x - 10) + 10 = 7x + 6$$

If the answer is not an integer, enter the answer as a fraction, not a decimal.

**Algebra:**

✓ 1.16923076923077

**Hints:**

- Distribute 8 to the terms in the parenthesis.

$$8(9x - 10) + 10 = 7x + 6$$

$$8*9x - 8*10 + 10 = 7x + 6$$

$$72x - 80 + 10 = 7x + 6$$

- Combine like terms

$$72x - 80 + 10 = 7x + 6$$

$$72x - 70 = 7x + 6$$

- Isolate the variable

$$72x - 7x - 70 + 70 = 7x - 7x + 6 + 70$$

$$65x - 0 = 0 + 76$$

$$65x = 76$$

- Divide both sides by the coefficient of x:

$$\frac{65x}{65} = \frac{76}{65}$$

$$\frac{65}{65} = \frac{76}{65}$$

$$x = \frac{76}{65}$$

$$x = \frac{76}{65}$$

The variable x is 76/65

Type in 76/65

---

#### 2) Assessment #235088 "235088 - Solve for x"

Solve for x.

$$\frac{5x}{10} (7 - 10) = -8$$

If the answer is not an integer, enter the answer as a fraction, not a decimal.

**Algebra:**

✓ 5.33333333333333

**Hints:**

•

$$\frac{5x}{10} (7 - 10) = -8$$

$$\frac{5x}{10} (-3) = -8$$

$$\frac{5x}{10} * -3 = -8$$

$$\frac{-15x}{10} = -8$$

•

$$\frac{-15x}{10} = -8$$

$$\frac{-15x * 10}{10} = -8 * 10$$

$$-15x = -80$$

•

$$-15x = -80$$

$$-15x -80$$

$$\underline{\hspace{1cm}} = \underline{\hspace{1cm}}$$

$$\frac{-15}{-15}$$

$$x = \frac{-80}{-15}$$

The variable x is -80/-15.

Type in -80/-15

3) Assignment #235126 "235126 - 234320 - Solve for x"

Solve for x.

$$\frac{3x}{4}(5 - 10) = 10x + 11$$

If the answer is not an integer, enter the answer as a fraction, not a decimal.

**Algebra:**

✓ -0.8

**Hints:**

•

$$\frac{3x}{4}(5 - 10) = 10x + 11$$

$$\frac{3x}{4}(-5) = 10x + 11$$

$$\frac{3x}{4} * -5 = 10x + 11$$

$$\frac{-15x}{4} = 10x + 11$$

•

$$\frac{-15x}{4} = 10x + 11$$

$$\frac{-15x \cdot 4}{4} = (10x + 11) \cdot 4$$

$$-15x = 40x + 44$$

$$\begin{aligned} -15x - 40x &= 40x + 44 - 40x \\ -55x &= 44 \end{aligned}$$

$$\frac{-55x}{-55} = \frac{44}{-55}$$

$$x = \frac{44}{-55}$$

The variable x is 44/-55.

Type in 44/-55

#### 4) Assignment #235172 "235172 - 234310 - Solving Equations"

Solve for x.

$$7(4x - 9) + 10 = 5x - 5$$

If the answer is not an integer, enter the answer as a fraction, not a decimal

**Algebra:**

✓ 2.08695652173913

**Hints:**

- Distribute 7 to the terms in the parenthesis.

$$7(4x - 9) + 10 = 5x - 5$$

$$7 \cdot 4x - 7 \cdot 9 + 10 = 5x - 5$$

$$28x - 63 + 10 = 5x - 5$$

- Combine like terms

$$28x - 63 + 10 = 5x - 5$$



$$28x - 53 = 5x - 5$$

- Isolate the variable

$$28x - 5x - 53 + 53 = 5x - 5x - 5 + 53$$

$$23x - 0 = 0 + 48$$

$$23x = 48$$

- Divide both sides by the coefficient of x:

$$\frac{23x}{23} = \frac{48}{23}$$

$$\frac{23}{23} = \frac{23}{23}$$

$$x = \frac{48}{23}$$

The variable x is 48/23

Type in 48/23

5) Assignment #235218 "235218 - 234321 - Solve for x"

Solve for x.

$$x - 6 = \frac{8}{3}(11 - 9x)$$

If the answer is not an integer, enter the answer as a fraction, not a decimal

**Algebra:**

✓ 1.41333333333333

**Hints:**

- Clear the fraction

$$(x - 6) * 3 = \frac{8}{3} * 3 (11 - 9x)$$

$$(x - 6) * 3 = 8 (11 - 9x)$$

Distribute

$$(x * 3 - 6 * 3) = (11 * 8 - 9x * 8)$$

$$3x - 18 = 88 - 72x$$

- Isolate the variable

$$3x + 72x - 18 = 88 - 72x + 72x$$

$$75x - 18 + 18 = 88 + 18$$

$$75x = 106$$

- 

$$\frac{75x}{75} = \frac{106}{75}$$

$$x = \frac{106}{75}$$

$$x = \frac{106}{75}$$

The variable x is 106/75

Type in 106/75

## Adding and Subtracting Polynomials

2/29/12

Assessment-Printing Content

### Problem Set "Sequence #41546" id:[41546]

#### 1) Assisment #235867 "235867 - 233799 - Adding and Subtracting Polynomials A"

Perform the indicated operation and simplify.

$$(10b + 7) + (b^2 - 7b + 9)$$

#### Multiple choice:

☒  $b^2 + 3b + 16$

☐  $b^2 - 17b + 2$

☐  $17b + 2$

☐  $3b - 16$

#### Hints:

- The answer is:

$$b^2 + 3b + 16$$

Select it and submit.

---

#### 2) Assisment #235916 "235916 - Adding and Subtracting Polynomials B"

Perform the indicated operation and simplify.

$$(7y^2 + 10y + 10) - (4y + 4y^2 - 12)$$

#### Multiple choice:

☒  $3y^2 + 6y + 22$

☐  $3y^2 + 6y + -2$

☐  $3y^2 + 14y + 10$

☐  $17y + 22$

#### Hints:

- The answer is:

$$3y^2 + 6y + 22$$

Select it and submit.

---

#### 3) Assisment #235965 "235965 - 234163 - Adding and Subtracting Polynomials C"

Perform the indicated operation and simplify.

$$(3n^3 + 9n + 3) - (8n^2 + 8n + 8)$$

#### Multiple choice:

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- ☒  $3n^3 - 8n^2 + 1n - 5$   
☐  $-5n^2 + 1n - 5$   
☐  $3n^3 + 8n^2 + 17n + 11$   
☐  $-5n^3 - 17n - 11$

**Hints:**

- The answer is:

$$3n^3 - 8n^2 + 1n - 5$$

Select it and submit.

---

**4) Assisment #236041 "236041 - 235861 - Adding and Subtracting Polynomials C1"**

Perform the indicated operation and simplify.

$$(7n^3 + 10n + 3) - (3n^2 + 9n + 6)$$

**Multiple choice:**

- ☒  $7n^3 - 3n^2 + 1n - 3$   
☐  $4n^2 + 1n - 3$   
☐  $7n^3 + 3n^2 + 19n + 9$   
☐  $4n^3 - 19n - 9$

**Hints:**

- The answer is:

$$7n^3 - 3n^2 + 1n - 3$$

Select it and submit.

## Multiplying Binomials

2/29/12

Assignment - Printing Content

### Problem Set "Sequence #41547" id:[41547]

#### 1) Assignment #236136 "236136 - Multiplying Polynomials A"

Multiply:

$$(x + 4)(5x + 3)$$

**Multiple choice:**

☒  $5x^2 + 23x + 12$

☐  $1x^2 + 3x + 12$

☐  $6x^2 + 13x + 7$

☐  $5x^2 + 12x + 12$

**Hints:**

- The answer is:

$$5x^2 + 23x + 12$$

Select it and submit.

---

#### 2) Assignment #236136 "236136 - 234493 - Multiplying Polynomials B"

Find the product

$$-2ax^5(2ax^3 + 10x^2 + 4a)$$

**Multiple choice:**

☒  $-4a^2x^8 - 20ax^7 - 8a^2x^5$

☐  $-4x^8 - 20x^7 - 8a^2x^5$

☐  $-4x^8 + -20ax^7 + 8x^5$

☐  $-4ax^8 + -20ax^7 + 8ax^5$

**Hints:**

- The answer is:

$$-4a^2x^8 - 20ax^7 - 8a^2x^5$$

Select it and submit.

**3) Assignment #236270 "236270 - 234373 - Multiplying Polynomials B"**

Simplify

$$48x + 5x(3x^2 - 9x - 9)$$

**Multiple choice:**

- ☒  $15x^3 - 45x^2 + 3$   
☐  $15x^3 + 45x^2 - 3$   
☐  $63x^3 - 45x^2 + 3$   
☐  $15x^3 - 3x^2 + 45$

**Hints:**

- The answer is:

$$15x^3 - 45x^2 + 3$$

Select it and submit.

---

**4) Assignment #236355 "236355 - Multiplying Polynomials C"**

Simplify

$$(2x + 50)x + -4x(6x + 11) - 6$$

**Multiple choice:**

- ☒  $-22x^2 + 6x - 6$   
☐  $-24x^2 - -44x - 6$   
☐  $8x^2 + 61x - -24$   
☐  $68x^2 + 56x - 6$

**Hints:**

- The answer is:

$$-22x^2 + 6x - 6$$

Select it and submit.

## Rational Expressions

2/29/12

Assignment - Printing Content

### Problem Set "Sequence #41548" id[41548]

#### 1) Assignment #233503 "233503 - Adding Rational Expressions"

Perform the indicated operation and simplify.

$$\frac{3}{x} + \frac{7}{x^2}$$

#### Multiple choice:

☒  $(3x + 7) / x^2$

☐  $(3 + 7x) / x^2$

- Do the numerator again.

☐  $10 / (x + x^2)$

- Create a common denominator.

☐  $(3x + 7) / (x + x^2)$

- Check the common denominator.

#### Hints:

- Rewrite the first fraction, so that its denominator is  $x^2$ .

$$\frac{3}{x} * \frac{x}{x} = \frac{3x}{x^2}$$

- Add the fractions. The result is

$$\frac{3x}{x^2} + \frac{7}{x^2} = \frac{3x + 7}{x^2}$$

Enter  $(3x + 7) / x^2$

#### 2) Assignment #233511 "233511 - Simplifying Rational Expressions"

Simplify this rational expression:

$$\frac{x^2 + 5x + 6}{x^2 + 3x + 2}$$

Select your answer from the choices below.

#### Multiple choice:

☒  $(x + 3) / (x + 1)$

- ☒  $(5x + 6) / (3x + 2)$ 
  - Only factors can be canceled.
- ☒  $(x - 3) / (x - 1)$ 
  - Check your algebraic signs.
- ☒  $11 / 5$ 
  - Only factors can be canceled.
- ☒ No further simplification possible

**Hints:**

- There may be common factors, so we should attempt to factor both the numerator and denominator.
- Try to factor the numerator first.  
The numerator becomes  $(x + 3) * (x + 2)$ .
- Try to factor the denominator. The denominator becomes  $(x + 2) * (x + 1)$ .  
Combine these results and cancel any common factors.
- Cancel the common factor  $(x + 2)$ . We get

$$\frac{(x + 3) * (x + 2)}{(x + 2) * (x + 1)}$$

$$(x + 3) / (x + 1)$$

Cancel the common factor.

Submit the result  $(x + 3) / (x + 1)$ .

**3) Assignment #233519 "233519 - 212822 - Adding Rational Expressions"**

Perform the indicated operations and simplify.

$$\frac{8}{x} + \frac{8}{x+1}$$

**Multiple choice:**

- ☒  $8(2x + 1) / (x * (x + 1))$
- ☒  $8(x + 1) / (x * (2x + 1))$ 
  - Check your algebraic signs.
- ☒  $8 / (x * (x + 1))$ 
  - Check your algebraic signs.
- ☒  $8(2x + 1) / (x + 1)$ 
  - Find the common denominator.
- ☒  $8(x + 1) / (2x + 1)$ 
  - Find the common denominator.

**Hints:**

- Determine the Least Common Denominator. The Least Common Denominator is  $x(x + 1)$ .



- Determine the Least Common Denominator. The Least Common Denominator is  $x(x+1)$ . Rewrite the two fractions with the common denominator.

- The first fraction becomes

$$\frac{8}{x} \cdot \frac{(x+1)}{(x+1)} = \frac{8x+8}{x(x+1)}$$

Convert the second fraction in a similar way.

- The second fraction becomes

$$\frac{8}{x+1} \cdot \frac{x}{x} = \frac{8x}{x(x+1)}$$

Combine the two new fractions.

- The result is

$$\frac{8x+8+8x}{x(x+1)} = \frac{8(2x+1)}{x(x+1)}$$

Select  $8(2x+1) / (x*(x+1))$  as the answer.

#### 4) Assignment #233528 "233528 - Rational Expression"

Simplify this rational expression:

$$\frac{3x+21}{5x+35}$$

Select your answer below.

**Multiple choice:**

☒ 3 / 5

☐ 10 / 12

- Factor, then cancel

☐ 24 / 40

- Factor, then cancel

☐ 5 / 3

- Check factoring.

**Hints:**

- Factor the numerator and denominator. Our rational expression becomes

$$\frac{3(x+7)}{5(x+7)}$$

$$\frac{3(x+7)}{5(x+7)}$$

- Cancel the common factor of  $(x + 7)$ .

$$\frac{3(x+7)}{5(x+7)}$$

We get the answer:

$$3 / 5$$

Pick the correct answer,  $3 / 5$ , below.

5) Assessment #233536 "233536 - Simplifying Rational Expressions"

Considering only  $3x > 7$ , simplify this rational expression:

$$\frac{3x^2 + 10x + 7}{9x^2 - 49}$$

Select the correct answer from the following:

**Multiple choice:**

✓  $(x + 1) / (3x - 7)$

✗  $(x - 1) / (3x + 7)$

- Check algebraic signs.

✗  $(x - 1) / (3x - 7)$

- Check algebraic signs.

✗  $(x + 1) / (3x + 7)$

- Check algebraic signs.

**Hints:**

- Factor the numerator. The factored numerator is  $(3x + 7) * (x + 1)$ .

Now factor the denominator.

- We now have

$$\frac{(3x + 7) * (x + 1)}{(3x + 7) * (3x - 7)}$$

Cancel the common factor  $(3x + 7)$ .

- Submit the result  $(x + 1) / (3x - 7)$ .

6) Assessment #233543 "233543 - 213065 - Division of Radical Expressions"

Simplify this rational expression:

$$\frac{x^2 - 9}{x^2 + 10x + 21} \div \frac{3 - x}{x + 7}$$

**Multiple choice:**

✓ -1

✗  $(x-3) / (3-x)$

• Check your cancellation.

✗  $-(x+3)*(x+7) / (x^2+10x+21)$

• Check your cancellation.

✗ No simplification possible

✗ 1

• Check your algebraic signs.

**Hints:**

- Use the definition of division for fractions:  $a/b \div c/d = a/b * d/c$

We get

$$\frac{x^2 - 9}{x^2 + 10x + 21} * \frac{x + 7}{3 - x}$$

- Factor the numerator and denominator of the first fraction. We get

$$\frac{(x+3)*(x-3)}{(x+3)*(x+7)} * \frac{(x+7)}{(3-x)}$$

Cancel the common factors of  $(x+3)$  and  $(x+7)$ .

We get

$$\frac{(x-3)}{(3-x)}$$

- Change the sign in the denominator.

We get

$$\frac{x-3}{-1}$$

$$(-1)*(x-3)$$

Simplify to get -1 as the result. Enter this as your answer.

Simplify this rational expression:

$$\frac{x^7 + 2x^6 + 1x^5}{x^3(x+1)^6}$$

Select the answer below:

**Multiple choice:**

✓  $\frac{x^2}{(x+1)^4}$

✗  $\frac{x^{(-2)}}{(x+1)^4}$

✗  $x^2 / (x+1)^6$

✗  $x^2 * (x^2 + 2x + 1) / (x+1)^6$

**Hints:**

- Factor a power of x in the numerator.

$$\frac{x^5(x^2 + 2x + 1)}{x^3(x+1)^6}$$

- Cancel the power of x.

$$\frac{x^2(x^2 + 2x + 1)}{(x+1)^6}$$

- Factor the numerator.

$$\frac{x^2(x+1)^2}{(x+1)^6}$$

- Cancel the common factor of  $(x+1)^2$ . Our result is

$$\frac{x^2}{(x+1)^4}$$

Select  $x^2 / (x+1)^4$ .

8) Assessment #233574 "233574 - 210992 - Subtracting Rational Expressions"

Perform the indicated operation and simplify.

$$\frac{6}{x} - \frac{6}{x+1}$$

Multiple choice:

- ☒  $6 / (x * (x+1))$
- ☐  $(6x + 6) / (x * (x+1))$ 
  - Check your algebraic signs.
- ☐  $6x / (x * (x+1))$ 
  - Check your algebraic signs.
- ☐  $6 / (2x + 1)$ 
  - Find the common denominator.
- ☐  $6x / (2x + 1)$ 
  - Find the common denominator.

Hints:

- The Least Common Denominator is  $x(x+1)$ .  
Convert each of the fractions so that each has the common denominator.

$$\frac{6}{x} - \frac{6}{x+1}$$

Start with the first fraction.

The first fraction becomes

$$\frac{6}{x} * \frac{(x+1)}{(x+1)} = \frac{6x+6}{x(x+1)}$$

- The second fraction becomes

$$\frac{-6}{x+1} * \frac{x}{x} = \frac{-6x}{x(x+1)}$$

- Combine the two fractions. The result is

$$\frac{6}{x} - \frac{6}{x+1}$$

$$\frac{-}{x} - \frac{-}{x+1}$$

$$= \frac{6x+6}{x(x+1)} + \frac{-6x}{x(x+1)}$$

$$= \frac{6}{x(x+1)}$$

Select  $6 / (x*(x+1))$  as the answer.

9) Assisment #233581 "233581 - Simplifying Rational Expressions"

Simplify this rational expression:

$$\frac{x^2 - 10x + 21}{x^2 - 9x + 14}$$

Select your answer from the choices below.

**Multiple choice:**

☒  $(x+3) / (x+2)$

- Check your algebraic signs.

☒  $(-10x+21) / (-9x+14)$

- Only factors can be canceled.

☒  $(x-3) / (x-2)$

☒  $11 / 5$

- Only factors can be canceled.

☒ No further simplification possible

**Hints:**

- There may be common factors, so we should attempt to factor both the numerator and denominator.

Try to factor the numerator first.

(For help with factoring copy this link into your browser's address bar:

<http://www.assisments.org/preview/assisment/199339>)

- The numerator becomes  $(x-3) * (x-7)$ .

Now try to factor the denominator. The denominator becomes  $(x-7) * (x-2)$ .

Combine these results and cancel any common factors.

- We get

$$\frac{(x-3) * (x-7)}{(x-7) * (x-2)}$$

$$\frac{(x-3) \cdot (x-7)}{(x-7) \cdot (x-2)}$$

$$(x-7) \cdot (x-2)$$

Cancel the common factor  $(x-7)$ .

Submit  $(x-3) / (x-2)$

10) Assessment #233599 "233599 - 208678 - Simplifying Rational Expressions"

Simplify this rational expression:

$$\frac{7x-35}{28x}$$

$$28x$$

Select your answer below.

**Multiple choice:**

✓  $(x-5) / (4x)$

✗  $(x-35) / 4$

- Factor, then cancel

✗  $(7x-5) / (4x)$

- Factor, then cancel

✗  $(x-5) / (28x)$

- Cancel completely.

**Hints:**

- Factor the numerator.

We get  $7(x-5)$

Factor the denominator.

- Our rational expression becomes

$$\frac{7(x-5)}{7 \cdot (4x)}$$

$$7 \cdot (4x)$$

- Notice that we have a common factor of  $7$ .

$$\frac{7(x-5)}{7(4x)}$$

$$7(4x)$$

Canceling, we get the answer:

$$\frac{x-5}{4x}$$

Enter it below as (x - 5) / (4x).

**11) Assessment #233607 "233607 - 212853 - Subtraction of Rational Expressions"**

Perform the indicated operation and simplify.

$$\frac{8}{x+2} - \frac{8}{x+5}$$

**Multiple choice:**

☒  $24 / ((x+2) * (x+5))$

☒  $56 / ((x+2) * (x+5))$

- Check your algebraic signs.

☒  $24 / (2x + 10)$

- Find the common denominator.

☒  $56 / (2x + 10)$

- Find the common denominator.

**Hints:**

- Determine the Least Common Denominator.

- The Least Common Denominator is  $(x+2) * (x+5)$ .  
Convert the first term to this denominator. The first term becomes

$$\frac{8}{(x+2)} * \frac{(x+5)}{(x+5)} = \frac{8x + 40}{(x+2)*(x+5)}$$

Convert the second term in a similar way.

$$\frac{8}{(x+5)} * \frac{(x+2)}{(x+2)} = \frac{8x + 16}{(x+2)*(x+5)}$$

- Combine the previous results to get

$$\frac{8x + 40 - (8x + 16)}{(x+2)*(x+5)} = \frac{24}{(x+2)*(x+5)}$$



## Dividing Polynomials

2/29/12

Assignment - Printing Contest

### Problem Set "Sequence #41549" id:[41549]

#### 1) Assignment #236423 "236423 - Dividing a polynomial by a monomial A"

Perform the indicated operation and simplify:

$$\frac{15x^4 - 15x^1}{-5x^4}$$

#### Multiple choice:

- ☒  $-3 + (3/x^3)$
- ☐  $3 - (3/x^3)$
- ☐  $3 + 3x^3$
- ☐  $15 + (15/x^3)$

#### Hints:

- The answer is:

$$-3 + (3/x^3)$$

Select it and submit.

---

#### 2) Assignment #236485 "236485 - Dividing a polynomial by a monomial C"

Perform the indicated operation and simplify:

$$\frac{-12x^6 + 30x^5 - 6x^3 + 30x^2}{6x^5}$$

#### Multiple choice:

- ☒  $-2x + 5 - (1/x^2) + (5/x^3)$
- ☐  $2x - 30 + (6/x^2) - (30/x^3)$
- ☐  $-12x + 30 - (6/x^2)$
- ☐  $-2x + 11$

#### Hints:

- The answer is:

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1/3

$$-2x + 5 - (1/x^2) + (5/x^3)$$

Select it and submit.

3) Assessment #236537 "236537 - 234167 - Dividing a polynomial by a monomial B"

Perform the indicated operation and simplify:

$$\frac{20x^8 + 25x^5 + 25^4}{5x^5}$$

Multiple choice:

- ☒  $4x^3 + 5 + (5/x)$
- ☐  $4x^3 + (5/x)$
- ☐  $4x^3 + 10$
- ☐  $20x^3 + 5 + (25/x)$

Hints:

- The answer is:

$$4x^3 + 5 + (5/x)$$

Select it and submit.


4) Assessment #236617 "236617 - 236422 - Dividing a polynomial by a monomial C1"

Perform the indicated operation and simplify:

$$\frac{-16x^8 + 4x^5 - 20x^4 + 8x^3}{-4x^5}$$

Multiple choice:

- ☒  $\frac{4x^3}{4x^3} + 4 - (20/x) + (2/x^2)$
- ☐  $-16x^3 + 4 - (20/x)$

  $-4x^3 - 8$

**Hints:**

- The answer is:

$$4x^3 - 1 + (5/x) - (2/x^2)$$

Select it and submit.

---

# Greatest Common Monomial Factor

2/29/12

Assignment - Printing Content

## Problem Set "Sequence #41550" id:[41550]

### 1) Assignment #63876 "63876 - 61574 - GCF (none)"

What is the *greatest common factor* shared by the monomials in the following expression?

$$1x + 2$$

If there is no greatest common factor, type in 1.

Algebra:

✓ 1

Hints:

- Try factoring out the greatest common **coefficient** first

and then

the greatest common **variable** second.

- The terms have no greatest common coefficient in common.  
The most you can factor out of the expression is 1.
- The terms have no greatest common variable in common.  
The most you can factor out of the expression is 1.

The greatest common factor of the original expression is 1 because it cannot be factored.

### 2) Assignment #63890 "63890 - 61573 - GCF (linear)"

What is the *greatest common factor* shared by the monomials in the following expression?

$$16x - 24$$

If there is no greatest common factor, type in 1.

Algebra:

✓ 8

✓ -8

Hints:

- Try factoring out the greatest common **coefficient** first

and then

the greatest common **variable** second.

- Begin by factoring the greatest common coefficient out of the expression.

$$16x - 24$$

$$= (8 \cdot 2)x - (8 \cdot 3) \text{ Each term has 8 in common.}$$

$$= 8(2x - 3)$$

- The terms have no greatest common variable in common.

The greatest common factor out of the expression is 8.

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The most you can factor out of the expression is 1.

The greatest common factor of the original expression is 8. Type in 8.

3) Assignment #63911 "63911 - 61571 - GCF (no #)"

What is the *greatest common factor* shared by the monomials in the following expression?

$$-3x^4 + 4x^3 + 5x^2$$

Use the **caret** symbol for exponents: ( $2x^3 = 2x^3$ )

If there is no greatest common factor, type in 1.

**Algebra:**

✓  $x^2$

✓  $-x^2$

**Hints:**

- Try factoring out the greatest common **coefficient** first

and then

the greatest common **variable** second.

- The terms have no greatest common coefficient in common.

The most you can factor out of the coefficients is 1.

- Factor the greatest common variable out of the expression.

$$-3x^4 + 4x^3 + 5x^2$$

$$= -3x^2x^2 + 4x^2x^1 + 5x^2 \text{ Each term has } x^2 \text{ in common.}$$

$$= x^2 (-3x^2 + 4x^1 + 5)$$

The greatest common factor of the original expression is  $x^2$ . Type in  $x^2$ .

4) Assignment #63931 "63931 - 56779 - GCF"

What is the *greatest common factor* shared by the monomials in the following expression?

$$6x^4 + 8x^3 - 10x^2$$

Use the **caret** symbol for exponents: ( $2x^3 = 2x^3$ )

If there is no greatest common factor, type in 1.

**Algebra:**

✓  $2*x^2$

✓  $-2*x^2$

**Hints:**

- Try factoring out the greatest common **coefficient** first

and then

the greatest common **variable** second.

- Begin by factoring the greatest common coefficient out of the expression.

$$\begin{aligned}
 &6x^4 + 8x^3 - 10x^2 \\
 &= (2 \cdot 3)x^4 + (2 \cdot 4)x^3 - (2 \cdot 5)x^2 \text{ Each term has 2 in common.} \\
 &= 2 ( 3x^4 + 4x^3 - 5x^2 )
 \end{aligned}$$

- Factor the greatest common variable out of the expression.

$$\begin{aligned}
 &2 ( 3x^4 + 4x^3 - 5x^2 ) \\
 &= 2 ( 3x^2x^2 + 4x^2x^1 - 5x^2 ) \text{ Each term has } x^2 \text{ in common.} \\
 &= 2x^2 ( 3x^2 + 4x^1 - 5 )
 \end{aligned}$$

The greatest common factor of the original expression is  $2x^2$ . Type in  $2x^2$ .

---

# Factoring Difference of Squares

2/29/12

Assignment - Printing Content

## Problem Set "Sequence #41552" id[41552]

### 1) Assignment #228256 "228256 - Factoring polynomials "

Factor the following polynomial:

$$25x^2 - 4$$

Once you have the polynomial factored enter one of the two factors

**Algebra:**

✓  $(5x+2)$

✓  $(5x-2)$

**Hints:**

- To factor this polynomial, you must use the **difference of squares** equation.

$$a^2 - b^2 = (a-b)(a+b)$$

- The reason we use this equation is because both terms are squares. What does that mean?

The equation  $25x^2 - 4$  has two terms and each one has a square root.

Term  $a = 25x^2$  Term  $b = 4$

So now we take the square root of each term.

Term  $a: \sqrt{25x^2} = 5x$

Term  $b: \sqrt{4} = 2$

- Now, you can just plug those answers into the **difference of squares** equation.

$$a = 5x \quad b = 2$$

$$(a^2 - b^2) = (a-b)(a+b)$$

$$(5x^2 - 2^2) = (5x-2)(5x+2)$$

- Enter either  $(5x-2)$  or  $(5x+2)$

---

### 2) Assignment #228317 "228317 - Factoring polynomials "

Factor the following polynomial:

$$x^2 - 49$$

Please enter one of the two factors below:

**Algebra:**

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✓ (x+7)

✓ (x-7)

**Hints:**

- To **factor** this polynomial, you must use the **difference of squares** equation.

$$a^2 - b^2 = (a - b)(a + b)$$

- The reason we use this equation is because both terms are squares.

What does that mean?

The equation  $x^2 - 49$  has two terms and each one has a square root.

Term **a** =  $x^2$    Term **b** = 49

So now we take the square root of each term.

Term **a**:  $\sqrt{x^2} = x$

Term **b**:  $\sqrt{49} = 7$

- Now, you can just plug those answers into the **difference of squares** equation.

$$a = x \quad b = 7$$

$$(a^2 - b^2) = (a - b)(a + b)$$

$$(x^2 - 7^2) = (x - 7)(x + 7)$$

- Enter either **(x-7)** or **(x+7)**



## Factoring Trinomial with Leading Coefficients of One

2/29/12

### Assignment- Printing Content

Problem Set "Sequence #41554" id:[41554]

1) Assisment #228363 '228363 - 43056'

Factor the following polynomial:

$$x^2 - 50x + 49$$

Once you have factored the polynomial, please enter one of the factors below:

**Algebra:**

✓ (x-1)

✓ (x-49)

**Hints :**

- Factoring means you want to get the polynomial in this form

$$(\underline{\hspace{1cm}}x + \underline{\hspace{1cm}})(\underline{\hspace{1cm}}x + \underline{\hspace{1cm}})$$

Since  $x^2 - 50x + 49$  has no coefficient to  $x^2$ , neither of the  $x$ 's in the factored form have a coefficient, meaning you only have to find the values of the two blanks.

$$(x + \underline{\hspace{1cm}})(x + \underline{\hspace{1cm}})$$

The question is only asking for one of the factors:  $(x + \underline{\hspace{1cm}})$

- We have :  $x^2 - 50x + 49$

Since the product of the last terms must be 49

The last terms could be:

7 and 7, because  $7 \times 7 = 49$

-7 and -7, because  $-7 \cdot -7 = 49$

49 and 1, because  $49 \times 1 = 49$  OR

-49 and -1, because  $-49 \cdot -1 = 49$

So you either have:

$$(x + 7)(x + 7)$$

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$$\frac{(x-1)(x-1)}{(x+49)(x+1)} \cdot \frac{(x-49)(x-1)}{(x-49)(x-1)}$$

- We have:  $x^2 - 28x + 147$

Since the product of the last terms must be 147, and 147 has three prime factors (7, 7, and 3).

The last terms could be:

147 and 1, because  $147 \cdot 1 = 147$

-147 and -1, because  $-147 \cdot -1 = 147$

7 and 21, because  $7 \cdot 21 = 147$

-7 and -21, because  $-7 \cdot -21 = 147$

49 and 3, because  $49 \cdot 3 = 147$

-49 and -3, because  $-49 \cdot -3 = 147$

7 and 21, because  $7 \cdot 21 = 147$

-7 and -21, because  $-7 \cdot -21 = 147$

- To find which set is right, we need to determine which results in b. Because the coefficient of  $x^2$  is one, only the sum of the last terms need to add to b.

Thus we must look at all possible combinations until we find the one that will result in b, 28.

$$(x + 147)(x + 1) : (x \cdot 1) + (x \cdot 147) = 148x$$

$$(x - 147)(x - 1) : (x \cdot -1) + (x \cdot -147) = -148x$$

$$(x + 7)(x + 21) : (x \cdot 21) + (x \cdot 7) = 28x$$

$$(x - 7)(x - 21) : (x \cdot -21) + (x \cdot -7) = -28x$$

$$(x + 7)(x + 21) : (x \cdot 21) + (x \cdot 7) = 28x$$

$$(x - 7)(x - 21) : (x \cdot -21) + (x \cdot -7) = -28x$$

$$(x + 49)(x + 3) : (x \cdot 3) + (x \cdot 49) = 52x$$

$$(x - 49)(x - 3) : (x \cdot -3) + (x \cdot -49) = -52x$$

- Only  $(x - 7)(x - 21)$  results in the correct b value

Type either (x-7) or (x-21).



$$(x - 11)(x - 11)$$

$$(x + 121)(x + 1)$$

$$(x - 121)(x - 1)$$

- To determine which of the four is correct, you must re-expand each and find a match to the original problem.

When you multiply you get:

$$(x + 11)(x + 11) = x^2 + 11x + 11x + 121 = x^2 + 22x + 121$$

$$(x - 11)(x - 11) = x^2 - 11x - 11x + 121 = x^2 - 22x + 121$$

$$(x + 121)(x + 1) = x^2 + 121x + x + 121 = x^2 + 122x + 121$$

$$(x - 121)(x - 1) = x^2 - 121x - x + 121 = x^2 - 122x + 121$$

- This one is correct:

$$(x - 121)(x - 1) = x^2 - 121x - x + 121 = x^2 - 122x + 121$$

Type either (x - 1) or (x - 121)

This polynomial is in a special form. When the polynomial is  $x^2 - (c+1)x + c$ , the factored form will always be  $(x-c)(x-1)$

## 2) Assisment #228577 "228577 - 61573 - GCF (linear)"

What is the *greatest common factor* shared by the monomials in the following expression?

$$8x - 24$$

If there is no greatest common factor, type in 1.

**Algebra:**

✓ 8

✓ -8

**Hints:**

- Try factoring out the greatest common **coefficient** first

and then

the greatest common **variable** second.

- Begin by factoring the greatest common coefficient out of the expression.

$$8x - 24$$

$$= (8*1)x - (8*3) \text{ Each term has 8 in common.}$$

$$= 8(1x - 3)$$

- The terms have no greatest common variable in common.

The most you can factor out of the expression is 1.

The greatest common factor of the original expression is 8. Type in 8.

## 3) Assisment #228578 "228578 - 56777 - GCF"

What is the *greatest common factor* shared by the monomials in the following expression?

$$-30x^4 + 24x^3 - 18x^2$$

Use the **caret** symbol for exponents: ( $2x^3 = 2x^3$ )

If there is no greatest common factor, type in 1.

**Algebra:**

✓  $6x^2$

✓  $-6x^2$

**Hints:**

- Try factoring out the greatest common **coefficient** first

and then

the greatest common **variable** second.

- Begin by factoring the greatest common coefficient out of the expression.

$$-30x^4 + 24x^3 - 18x^2$$

$$= -(6 \cdot 5)x^4 + (6 \cdot 4)x^3 - (6 \cdot 3)x^2 \text{ Each term has 6 in common.}$$

$$= 6(-5x^4 + 4x^3 - 3x^2)$$

- Factor the greatest common variable out of the expression.

$$6(-5x^4 + 4x^3 - 3x^2)$$

$$= 6(-5x^2x^2 + 4x^2x^1 - 3x^2) \text{ Each term has } x^2 \text{ in common.}$$

$$= 6x^2(-5x^2 + 4x^1 - 3)$$

The greatest common factor of the original expression is  $6x^2$ . Type in  $6x^2$ .

## 4) Assisment #228646 "228646 - Factoring polynomials "

**Factor** the following polynomial:

$$9x^2 - 9$$

Once you have the polynomial factored enter one of the two factors

**Algebra:**

✓  $(3x+3)$

✓  $(3x-3)$

**Hints :**

- To **factor** this polynomial, you must use the **difference of squares** equation.

$$a^2 - b^2 = (a - b)(a + b)$$

- The reason we use this equation is because both terms are squares.

What does that mean?

The equation  $9x^2 - 9$  has two terms and each one has a square root.

Term **a** =  $9x^2$    Term **b**:  $9$

So now we take the square root of each term.

Term a:  $\sqrt{9x^2} = 3x$

Term **b**:  $\sqrt{9} = 3$

- Now, you can just plug those answers into the **difference of squares** equation.

$$a = 3x \quad b = 3$$

$$(a^2 - b^2) = (a - b)(a + b)$$

$$(3x^2 - 3^2) = (3x - 3)(3x + 3)$$

- Enter either  $(3x-3)$  or  $(3x+3)$

5) Assignment #228693 '228693 - 43056'

Factor the following polynomial:

$x^2 - 6x + 9$

Once you have the polynomial factored enter one of the factors below:

**Algebra:**

✓ (x-3)

**Hints :**

- Factoring means you want to get the polynomial in this form

$$(\underline{\hspace{1cm}}x + \underline{\hspace{1cm}})(\underline{\hspace{1cm}}x + \underline{\hspace{1cm}})$$

Since  $x^2 - 6x + 9$  has no coefficient to  $x^2$ , neither of the  $x$ 's in the factored form have a coefficient, meaning you only have to find the values of the two blanks.

$$(x + \quad)(x + \quad)$$

The question is only asking for only one of the factors:  $(x + \underline{\hspace{1cm}})$

- We have:  $x^2 - 6x + 9$

Since the product of the last terms must be 9

The last terms could be:

3 and 3, because  $3 \cdot 3 = 9$

-3 and -3, because  $-3 \cdot -3 = 9$

9 and 1, because  $9 \cdot 1 = 9$  OR

-9 and -1, because  $-9 \cdot -1 = 9$

So you either have:

$$(x + 3)(x + 3)$$

$$(x - 3)(x - 3)$$

$$(x + 9)(x + 1)$$

$$(x - 9)(x - 1)$$

- To determine which of the four is correct, you must re-expand each and find a match to the original problem.

When you multiply you get:

$$(x + 3)(x + 3) = x^2 + 3x + 3x + 9 = x^2 + 6x + 9$$

$$(x - 3)(x - 3) = x^2 - 3x - 3x + 9 = x^2 - 6x + 9$$

$$(x + 9)(x + 1) = x^2 + 9x + x + 9 = x^2 + 10x + 9$$

$$(x - 9)(x - 1) = x^2 - 9x - x + 9 = x^2 - 10x + 9$$

- This one is correct:

$$(x - 3)(x - 3) = x^2 - 3x - 3x + 9 = x^2 - 6x + 9$$

Type (x-3)

---



## Write Linear Equation from Slope and Y-Intercept

2/29/12

Assessment-Printing Contest

### Problem Set "Sequence #41558" id:[41558]

#### 1) Assessment #231995 "231995 - 198797 - 196885 - Parallel and Perpendicular Lines - Points"

One line passes through the points (15,-10) and (16,-11).

Another line passes through the points (7,-2) and (8,-3).

Are these lines parallel, perpendicular, the same line, or none of these answers?

**Multiple choice:**

☐ Parallel

☐ Perpendicular

☒ They are the same line

☐ None of the above

**Hints:**

- Two lines are parallel if their slopes are the same

$$m_1 = m_2$$

The equation for the slope of a line is:

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

•

Find the slope of each line.

$$m_1 = \frac{-11 - -10}{16 - 15}$$

$$m_2 = \frac{-3 - -2}{8 - 7}$$

•

$$m_1 = \frac{-1}{1}$$

$$m_2 = \frac{-1}{1}$$

$$m_1 = m_2$$

The two slopes are the same, this means they are either parallel or the same line.  
Check to see if they are the same line.

- To check if the lines are the same, find y-intercept of both.  
Use the Point-slope form:  $y = mx + b$ , where  $b$  = y-intercept

For line 1:

$$(-10) = -1(15) + b$$

$$b = (-10) - -1(15)$$

$$b = 5$$

For line 2:

$$(-2) = -1(7) + b$$

$$b = (-2) - -1(7)$$

$$b = 5$$

$b_1 = b_2$  so the two lines are the same.  
Select that they are the same line.

## 2) Assessment #232003 "232003 - Write Linear Equation from Slope and Ordered Pair"

Write a linear equation for the line with slope = 7 going through the point: (-8, -3)

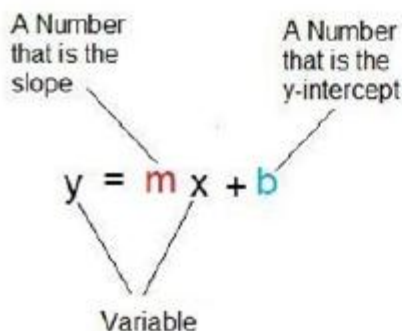
Write your equation in the form  $y = \underline{\hspace{2cm}}$

**Algebra:**

✓  $7x+53$

**Hints:**

- Linear equations can be written in this form where  $m$  is the slope and  $b$  is the y-intercept.



- We know that  $m = 7$  because the slope is 7, but we don't have the value of  $b$ .

We can find  $b$  by substituting in the slope = 7 and the point (-8, -3).

$$y = mx + b$$

$$-3 = 7 \cdot -8 + b$$

Substitute

Now solve for  $b$  and write the final equation.

- Now we will solve for  $b$ .

$$-3 = 7 \cdot -8 + b$$

$$-3 = -56 + b$$

$$-3 - -56 = b$$

$$b = -3 - -56$$

$$b = 53$$

- 

We know that  $m = 7$  and  $b = 53$ . $y = 7x + 53$  is the equation with slope  $7$  and goes through  $(-8, -3)$ Type in  $7x + 53$ **3) Assignment #232021 "232021 - 56517 - Find the slope (Undefined)"**

Find the slope of the line that passes through the following points. Write "undefined" if there is no slope.

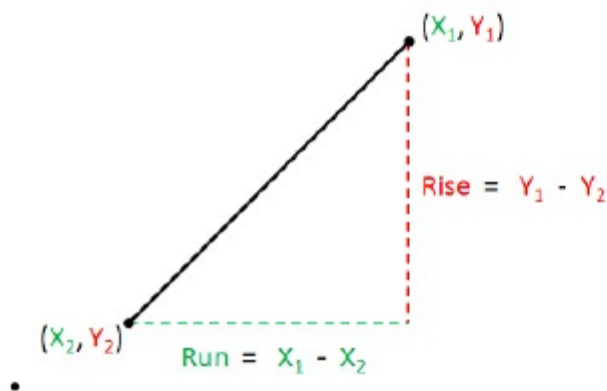
 $(-1, 0)$  $(-1, 9)$ 

Write your answer as a fraction if needed.

**Algebra:**

✓ undefined

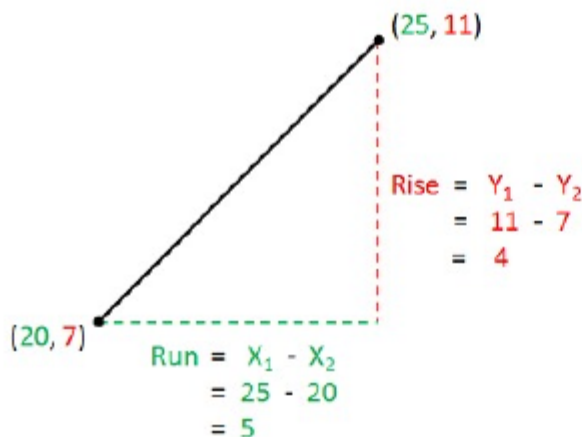
✓ Undefined

**Hints:**

Recall the definition of slope:

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{Y_1 - Y_2}{X_1 - X_2}$$

- Lets try an example:



$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{4}{5}$$

- To find **Rise** and **Run**, we will first label the points.  
 Lets use  $(-1, 0)$  to act as point  $(X_1, Y_1)$  and  $(-1, 9)$  to be point  $(X_2, Y_2)$ .

Using this, we can find **rise** and **run**.

$$\text{Rise} = Y_1 - Y_2 = 0 - 9 = -9$$

$$\text{Run} = X_1 - X_2 = -1 - -1 = 0$$

Now we can find the slope.

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{0 - 9}{-1 - -1} = \frac{-9}{0} = \text{undefined}$$

The slope is undefined because we cannot divide by 0.  
 Type in undefined.

#### 4) Assistent #232026 "232026 - Write Linear Equation from Slope and Ordered Pair"

Write a linear equation for the line with slope = -5 going through the point: (-7, 10)

Write your equation in the form  $y =$  \_\_\_\_\_

**Algebra:**

✓ -5x+25

**Hints:**

- Point-slope form is as follows:

$$y - y_1 = m(x - x_1)$$

- Here is how the data given in the problem relates to point slope form:

$$m = \text{slope} = -5$$

## Linear Equations from a Situation

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Assignment - Printing Cost

### Problem Set "Sequence #41559" id[41559]

#### 1) Assignment #228755 "228755 - Samantha starts a..."

Samantha starts a job at McDonald's that will pay her 11 dollars an hour. Samantha gets dropped off by her parents at the start of the shift but she takes a taxi home that costs her 12 dollars. Samantha works an h hour shift. After taking into account her taxi ride, write an expression for how much she makes in one night.

**Algebra:**

✓  $11h - 12$

**Hints:**

- First write a sentence with words then fill in the variables and numbers.

The amount Samantha makes in a night = What she gets paid - the cost of the ride.

- We are given that  
amount she gets paid = payment per hour \* number of hours worked  
=  $11h$

the cost of the ride = 12

- Now just put it together

The amount Samantha makes in a night =  $11h - 12$

#### 2) Assignment #228763 "228763 - 61768 - Linear Equation from Situation Phone"

A phone company charges a connection fee of \$0.92 and a variable cost per minute of \$0.06 for a call

Assume the number of minutes is your independent variable (x) and the cost is your dependent variable (y).

Find 'y', the cost of a phone call that lasts x minutes.

Write your equation in the form  $y = \underline{\hspace{2cm}}$ .

**Algebra:**

✓  $0.06x + 0.92$

**Hints:**

- Recall that slope-intercept form is

$$y = mx + b$$

Where m is the slope and b is the y-intercept.

- The slope of the line is the rate at which the cost of a phone call changes for each minute that passes.  
The rate at which the cost increases is \$0.06 per minute.  
The slope of the line would be  $m = 0.06$

- The y-intercept is cost of a call where x (or the independent variable) is equal to 0.

How much money does Diane make each day given the bank statement below?

Diane's salary does not change during the time shown by the statement.

### Diane's Account

Date	Balance (In \$)
Day 6	2067.00
Day 13	2445.00
Day 20	2823.00
Day 21	2877.00

### Algebra:

✓ 54

### Hints:

- Because Diane's salary is constant, the increase in their account balance is **linear**. To find the rate at which Diane's balance increases each day, you must find the **slope** of that line. Recall that to find the slope of a line, we calculate the following:

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}}$$

- In terms of Diane's balance, **Rise** is the increase in Diane's balance between two records, and **Run** is the number of days that passed between those records. A record is a line on the bank statement showing a date and an amount.

Therefore,

$$\text{Slope} = \frac{\text{Rise}}{\text{Run}} = \frac{\text{Increase in balance between records}}{\text{Days between records}}$$

- First, pick any two records.

Lets use (Day 6, \$2067.00) as record 1 and (Day 13, \$2445.00) as record 2.

Using this, we can find the **increase in balance** and the **number of days between the records**.

$$\text{Increase} = \text{Balance}_1 - \text{Balance}_2 = \$2067 - \$2445 = \$-378$$

$$\text{Days} = \text{Days}_1 - \text{Days}_2 = 6 - 13 = -7$$

Now we can find the rate that the account increases each day, or the **slope**.

$$\text{Slope} = \frac{\text{Increase}}{\text{Days}} = \frac{\$-378}{-7} = \$54$$

The amount that Diane's balance increases each day is \$54.

Type in 54.

6) Assignment #228830 "228830 - 109308 - %vtpj is in a rowb..."

Anthony is in a row boat on a lake. He is 893 yards from the dock. He then rows for  $m$  minutes back toward the dock. Anthony rows at a speed of 57 yards per minute. Write an expression for Anthony's distance from the dock dependent on the number of minutes he has rowed.

**Algebra:**

✓ 893-57m

**Hints:**

- First write a sentence with words then fill in the variables and numbers.

Anthony's Distance from the dock = the original distance from the dock - the distance rowed back towards the dock.

In this problem we also have (and remember distance = rate(speed) \* time):

the distance rowed back towards the dock = Anthony's Rowing speed \* the number of minutes rowed.

- Now replace what you have in words with variables and numbers.

Anthony's Distance from the dock = 893 - the distance he rows back towards the dock.

In this problem we also have distance=rate(speed)\*time:

the distance he rows back towards the dock = 57 \* m.

- Finish your replacement of variables for words.

Anthony's Distance from the dock= 893 - 57 \* m

Type in 893 - 57 \* m

7) Assignment #228850 "228850 - Linear Equation from Situation Freezer"

A deep freezer has a temperature of  $-19^{\circ}\text{C}$  when it is turned off.

The temperature then rises at  $2.5^{\circ}\text{C}$  per minute.

Assume the number of minutes is your independent variable ( $x$ ) and the current temperature is your dependent variable ( $y$ )

Find ' $y$ ', the current temperature of the freezer after  $x$  minutes

Write your equation in the form  $y = \underline{\hspace{2cm}}$ .

**Algebra:**

✓  $2.5x-19$

**Hints:**

- Recall that slope-intercept form is

$$y = mx + b$$

Where  $m$  is the slope and  $b$  is the y-intercept.

- The slope of the line is the rate at which the temperature of the deep freezer changes for each minute that passes.

The rate at which the temperature increases is  $2.5^{\circ}\text{C}$  per minute.

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Assessment- Printing Cost

The rate at which the temperature increases is 2.5 °C per minute.

The slope of the line would be  $m=2.5$

- The y-intercept is cost of a call where x (or the independent variable) is equal to 0. When the number of minutes is equal to 0, the temperature of the deep freezer is -19. On a graph the y-intercept would be  $b=-19$ .

The equation of the line would be  $y=2.5x-19$

Type in  $2.5x - 19$

---



When the number of minutes is equal to 0, the price of the call is 0.92.

On a graph the y-intercept would be  $b=0.92$ .

The equation of the line would be  $y=0.06x+0.92$

Type in  $0.06x+0.92$ .

3) Assignment #228783 "228783 - 109059 - % v(q) starts a job..."

Samantha starts a job at McDonald's. Samantha gets dropped off by her parents at the start of her shift but she takes a taxi home that costs her 11 dollars. Samantha gets paid  $d$  dollars for one night of work. After taking into account her taxi ride, write an expression for how much she makes in one night.

**Algebra:**

✓  $d-11$

**Hints:**

- First write a sentence with words then fill in the variables and numbers.

The amount Samantha makes in one night = What she gets paid - the cost of the taxi ride

- Now use the variables and numbers given.

Let  $I$  = Income, how much she gets paid.

$$I = d - 11$$

Type in  $d - 11$

4) Assignment #228788 "228788 - Sam's Pairs of Socks"

Sam has  $2m$  individual, interchangeable white socks mixed together in his drawer. He decides to go to the store and buy 16 more pairs of white socks. When he gets back, he decides to get rid of some of the mixed socks, and throws out 20 unmatched socks at the bottom of his drawer. How many PAIRS of socks does Sam have left after he has matched all of his socks up?

**Algebra:**

✓  $m+6$

**Hints:**

- The number of pairs of socks is equal to the number of individual socks minus the number of spare socks (i.e. any socks that can't be match up), divided by 2.
- The number of individual socks is equal to the number of socks Sam has to begin with, plus the number of socks he buys, minus the number of socks he throws away because they are ratty. In this instance, he has  $2m + 2*16 - 20 = 2m + 12$  socks.

- Since the number of socks is even, and every sock can be matched with another white sock, Sam has  $m + 12/2$  pairs of socks.

5) Assignment #228795 "228795 - 57338 - Find the Daily Earnings (random step)"

Diane works at a local convenience store and has been putting every penny earned into a savings account. Now, Diane wants to use a bank statement to graph the balance of the account.

How much money does Diane make each day during the bank statement balance?

**Problem Set "Sequence #41560"** id:[41560]**1) Assistent #233106 "233106 - 231984 - Systems of Equations "**

A) Carlos was given a system of equations to solve and decided to graph the two equations. What is the value of x in the solution of this system of equations?

**Algebra:**

✓ 1

✗ 1

- Close. But that is the value of y in the solution to this system of equations. The problem is asking for the value of x.

**Hints:**

- There are no hints for this problem. The next hint will reveal the answer.
- The value of x in the solution to the system of equations is 1.

Please type 1.

**Hints:**

- A graph is a picture of all the points where an equation is true. Any point that lies on a the **green** line satisfies the **green** equation. Any point on the **purple** line satisfies the **purple** equation.
- The only point where both equations are true is the **intersection**. This one point satisfies both equations. It is the **solution** to the system of equations. Find the value of x at this point.

- The lines intersect at the point  $(1, 1)$ .  
The  $x$  component of this point is  $1$ : it is the value of  $x$  in the solution of the system of equations.

Please type 1.

**B)** What is the value of  $y$  in the solution of this system of equations?

**Algebra:**

✓ 1

**x 1**

- Close. But that is the value of  $x$  in the solution to this system of equations. The problem is asking for the value of  $y$ .

**Hints :**

- There are no hints for this problem. The next hint will reveal the answer.
- The value of  $y$  in the solution to the system of equations is 1.

Please type 1.

**Hints :**

- A graph is a picture of all the points where an equation is true. Any point that lies on a the **green** line satisfies the **green** equation. Any point on the **purple** line satisfies the **purple** equation.
- The only point where both equations are true is the **intersection**. This one point satisfies both equations. It is the **solution** to the system of equations. Find the value of  $y$  at this point.

- The lines intersect at the point (1, 1).

The **y** component of this point is 1: it is the value of **y** in the solution of the system of equations.

Please type 1.

---

2) Assessment #233117 "233117 - Systems of Equations "

Solve the following system of equations.

$$5y = 20x + 25$$

$$-4y = -12x - 4$$

What is the value of x?

(If the value of x is not an integer, enter the answer as a fraction, not a decimal)

**Algebra:**

✓ -4

✗ -11

- Close. But this is the value of y. The question is asking for the value of x.

**Hints:**

- There are no hints for this problem. The next hint will reveal the answer.
- The value of x is -4

Please type -4

**Hints:**

- The problem asks you to find the value of x. You can use either substitution or elimination to do this, let's use substitution.

The first step is to solve one of the equations for the other variable, **y**.

Here, we solve the first equation for **y** in terms of **x**.

$$\frac{5y}{5} = \frac{20x + 25}{5}$$

$$y = 4x + 5$$

- The next step is to substitute the expression you found for  $y$  into the other equation.

Since we used the **first** equation to find

$$y = 4x + 5$$

we substitute the expression  $4x + 5$  for  $y$  in the **second** equation.

$$-4y = -12x - 4$$

$$-4(4x + 5) = -12x - 4$$

- Now we have an equation with only one unknown variable,  $x$ .  
The last step is to solve this new equation for  $x$ .

$$-4(4x + 5) = -12x - 4$$

$$\frac{-4(4x + 5)}{-4} = \frac{-12x - 4}{-4}$$

$$4x + 5 = 3x + 1$$

$$4x + 5 - 5 = 3x + 1 - 5$$

$$4x = 3x - 4$$

$$4x - 3x = 3x - 4 - 3x$$

$$x = -4$$

- The value of  $x$  is  $-4$   
Please type  $-4$

Solve the following system of equations.

$$3y - 7x = -2$$

$$2y - 5x = 7$$

What is the value of  $x$ ?

(If the value of  $x$  is not an integer, enter the answer as a fraction, not a decimal)

**Algebra:**

✓ -25

✗ -59

- Close. But that is the value of  $y$ . The problem is asking for the value of  $x$ .

**Hints:**

- The problem asks you to find the value of  $x$ . You can use either substitution or elimination to do this, let's use elimination.

We need to subtract one equation from the other in a way that makes any terms containing the variable  $y$  cancel out.

One way to do this is to multiply both sides of each equation by the  $y$  coefficient of the other equation.

$$3y - 7x = -2$$

$$2y - 5x = 7$$

The first equation is multiplied by 2, which is the  $y$  coefficient of the second equation.

The second equation is multiplied by 3, which is the  $y$  coefficient of the first equation.

$$2 * (3y - 7x) = 2 * -2$$

$$3 * (2y - 5x) = 3 * 7$$

$$6y - 14x = -4$$

$$6y - 15x = 21$$

- Now subtract one equation from the other.

$$6y - 14x = -4$$

$$6y - 15x = 21$$

$$6y - 14x = -4$$

$$- (6y - 15x) = - (21)$$

$$x = -25$$

Notice how the terms containing the variable  $y$  cancel out.

- Now we have an equation with only one unknown variable  $x$

The last step is to solve this new equation for  $x$ .

$$x = -25$$

=

The value of  $x$  is  $-25 / 1$

Please type  $-25 / 1$

**Hints:**

- There are no hints for this problem. The next hint will reveal the answer.
- The value of  $x$  is  $-25 / 1$

Please type  $-25 / 1$

---

## Factoring to Solve Quadratic Equations

2/29/12

Assignment - Printing Content

### Problem Set "Sequence #41563" id[41563]

#### 1) Assignment #233988 "233988 - 233502 - Quadratic Equations 2"

Solve the equation:

$$4x^2 + 68x + 288 = 0$$

The solutions are

**Multiple choice:**

✓ -9, -8

✗ 9, 8

✗ -9, 8

✗ 9, -8

**Hints:**

- First factor out the greatest common factor in the quadratic expression.

$$4(x^2 + 17x + 72) = 0$$

Dividing both sides by the factored out constant yields

$$(x^2 + 17x + 72) = 0$$

- Next factor the quadratic equation. After factoring, we get

$$(x + 9) * (x + 8) = 0$$

- $(x + 9) * (x + 8) = 0$  only if  $(x + 9) = 0$  or if  $(x + 8) = 0$

To determine when the first factor equals zero, solve the first equation:

$$(x + 9) = 0$$

- Solving  $(x + 9) = 0$  yields

$$x = -9$$

To determine when the second factor equals zero, solve the second equation:

$$(x + 8) = 0$$

- Solving  $(x + 8) = 0$  yields

$$x = -8$$

Choose the two solutions 0, 8 from the choices below  
[www.assessments.org/build/print/sequence/41563?mode=debug](http://www.assessments.org/build/print/sequence/41563?mode=debug)

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Choose the pair of values -5, -4 from the choices below.

2) Assessment #234049 "234049 - 233684 - Quadratic Equations 4"

Solve the equation:

$$5x^2 + 5x - 100 = 0$$

The solutions are

**Multiple choice:**

☒ -5, 4

☐ 5, 4

☐ -5, -4

☐ 5, -4

**Hints:**

- First factor out the greatest common factor in the quadratic expression.

$$5(x^2 + x - 20) = 0$$

Dividing both sides by the factored out constant yields

$$(x^2 + x - 20) = 0$$

- Next factor the quadratic equation. After factoring, we get

$$(x + 5) * (x - 4) = 0$$

- $(x + 5) * (x - 4) = 0$  only if  $(x + 5) = 0$  or if  $(x - 4) = 0$ .

To determine when the first factor equals zero, solve the first equation:

$$(x + 5) = 0$$

- Solving  $(x + 5) = 0$  yields

$$x = -5$$

To determine when the second factor equals zero, solve the second equation:

$$(x - 4) = 0$$

- Solving  $(x - 4) = 0$  yields

$$x = 4$$

Choose the pair of values -5, 4 from the choices below.

## 3) Assessment #234122 "234122 - 218353 - Quadratic Equations 3"

Solve the equation:

$$(x - 9) * (x + 2) = 0$$

The solutions are

**Multiple choice:**☒ 9, -2☐ 9, 2☐ -9, 2☐ -9, -2**Hints:**

- $(x - 9) * (x + 2) = 0$  only if  $(x - 9) = 0$  or if  $(x + 2) = 0$

To determine when the first factor equals zero, solve the first equation:

$$(x - 9) = 0$$

- Solving  $(x - 9) = 0$  yields

$$x = 9$$

To determine when the second factor equals zero, solve the second equation:

$$(x + 2) = 0$$

- Solving  $(x + 2) = 0$  yields

$$x = -2$$

Choose the pair of values 9, -2 from the choices below.

## 4) Assessment #234155 "234155 - 218541 - Quadratic Equations 5"

Solve the equation:

$$(x - 2) * (5x + 4) = 0$$

The solutions are

**Multiple choice:**☒ 2, -4/5☐ -2, -4/5☐ -2, 4/5☐ 2, 4/5**Hints:**

- $(x - 2) * (5x + 4) = 0$  only if  $(x - 2) = 0$  or if  $(5x + 4) = 0$

To determine when the first factor equals zero, solve the first equation:

$$(x - 2) = 0$$

- Solving  $(x - 2) = 0$  yields

$$x = 2.$$

To determine when the second factor equals zero, solve the second equation:

$$(5x + 4) = 0$$

- Solving  $(5x + 4) = 0$  yields

$$x = -4/5$$

Choose the pair of values  $2, -4/5$  from the choices below.

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## Square Roots of Algebraic Expressions

2/29/12

Assignment - Printing Contest

### Problem Set "Sequence #41564" id:[41564]

#### 1) Assignment #236673 "236673 - Square roots of algebraic expressions C"

Multiply or divide. Simplify if possible. All variables represent nonnegative real numbers.  
 $\sqrt{e}$  is the square root of  $e$ , where  $e$  can be any expression.

$$\sqrt{16x^2y^2} \cdot \sqrt{96x^2y}$$

#### Multiple choice:

- ☒  $16x^2y^2\sqrt{6x}$
- ☐  $16\sqrt{6xxy}$
- ☐  $16\sqrt{6x^2y^2}$
- ☐  $x^2y^2\sqrt{6xy}$

#### Hints:

- The answer is:

$$16x^2y^2\sqrt{6x}$$

Select it and submit.

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#### 2) Assignment #236717 "236717 - Square roots of algebraic expressions A"

Simplify, assume all variables represent nonnegative real numbers.  
 $\sqrt{e}$  is the square root of  $e$ , where  $e$  can be any expression.

$$6\sqrt{36y^5} - \sqrt{4y^5}$$

#### Multiple choice:

- ☒  $34y^2\sqrt{y}$
- ☐  $34\sqrt{y^5}$
- ☐  $10\sqrt{y}$
- ☐  $192y^2\sqrt{y}$

#### Hints:

- The answer is:

$$34y^2\sqrt{y}$$

Select it and submit.

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#### 3) Assignment #236723 "236723 - Square roots of algebraic expressions D"

Multiply or divide. Simplify if possible. All variables represent nonnegative real numbers.

[www.assistentix.org/build/print/sequence/41564?mode=debug](http://www.assistentix.org/build/print/sequence/41564?mode=debug)

1/2

$\sqrt{e}$  is the square root of  $e$ , where  $e$  can be any expression.

$$(\sqrt{3} + 3) \cdot (\sqrt{3} - 3)$$

**Multiple choice:**

- ☒ -6
- ☐  $2\sqrt{3} - 6$
- ☐ 6
- ☐  $3 - 3\sqrt{6}$

**Hints:**

- The answer is:

-6

Select it and submit.

**4) Assessment #236761 "236761 - 234497 - Square roots of algebraic expressions B"**

Multiply or divide. Simplify if possible.

$\sqrt{e}$  is the square root of  $e$ , where  $e$  can be any expression.

$$\sqrt{14} \cdot \sqrt{140}$$

**Multiple choice:**

- ☒  $14\sqrt{10}$
- ☐  $12\sqrt{4}$
- ☐  $2\sqrt{35}$
- ☐  $70\sqrt{2}$

**Hints:**

- The answer is:

$14\sqrt{10}$

Select it and submit.